PHARMACEUTICAL ABSTRACTS

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ABSTRACTORS

CONTENTS

NEW REMEDIES

SPECIALITIES (*Continued*)

Tonicum Bayer (I. G. Farbenindustrie, Leverkusen), contains as active constituents that part of liver extract conductive to blood formation, a nux vomica alkaloid, an organic arsenical, an easily resorbed phosphorous compound, mineral salts in the form in which they occur in the blood and the complex of vitamin B and vitamin C. The dose is one tablespoonful 2–3 times a day for adults and 1–2 teaspoonfuls for children.—*Pharm. Weekblad*, 75 (1938), 650. (E. H. W.)

Tussol (Curta & Co., G. m. b. H., Berlin-Britz) consists chiefly of drosera, verbascum, inula, althea, pimpinella, thyme and fennel. It is recommended as a cough remedy.—*Pharm, Zentralhalle*, 79 (1938), 640. (N. L.)

Uzaril (Uzara-werk, Melsungen) contains as active constituents, uzaron, extractum belladonnæ and sodium phenylethylbarbiturate. It is found on the market in tablets and drops. The quantities of active ingredients are not given. The dose is one tablet or 10 drops.—*Pharm. Weekblad*, 75 (1938), 650. (E. H. W.)

Vacagen (Sharpe and Dohme Ltd., London) is a mixed vaccine for oral administration. Each tablet contains the soluble antigenic fractions of about 60,000 million organisms, *viz.*, pneumococcus, types I, II and III (*Diplococcus pneumoniæ*), 25,000 million; streptococcus (hemolytic, non-hemolytic and viridans), 15,000 million; influenza bacillus (*Hemophilis influenzæ*), 5000 million; *M. catarrhalis* (*Neisseria catarrhalis*), 5000 million; *staphylococcus aureus*, 5000 million; Friedlander bacillus (*Klebsiella pneumoniæ*), 5000 million. It is used for prophylactic immunization against bacterial infections of the respiratory tract. The dose is one tablet before breakfast for eight successive days. It is marketed as enteric coated tablets, 20 in vial.—*Australasian J. Pharm.*, 20 (1939), 220. (A. C. DeD.)

Vasocor (Koninklijke Pharm. Fabrieken Brocades & Stheeman en Pharmacia) is a stable solution for intravenous injection containing *g*-strophanthin 0.0002 Gm. and theophylline 0.2 Gm. in 10 cc. of a 20% glucose solution. **Vasocor Forte** is also obtainable. This contains 0.0003 Gm. of strophanthin and 0.2 Gm. of theophylline in 10 cc. of a 20% glucose solution. The remedy is used in deficient heart action, heart damage etc. The dose is one 10 cc.-ampul as necessary, to three times a day intravenously. *Pharm. Weekblad*, 75 (1938), 650. (E. H. W.)

Vibeta (Dr. G. Henning, Berlin) is an oil obtained from wheat germ standardized as to its vitamin E content and sold in capsules containing 0.5 Gm., in 100 cc.-bottles and in 2 cc.-ampuls for intramuscular injection. The reproductive vitamin is used during pregnancy and lactation.—*Pharm. Weekblad*, 75 (1938), 400. (E. H. W.)

BACTERIOLOGY

p-Aminophenylsulfamide—Specific Action of a New Derivative of, on Experimental Streptococcic Septicemia. The sodium salt of p-sulfamidophenylpyridine-β-carbamido-α-carboxylic acid (R 120 of the J. Rosicky series) retarded or cured hemolytic streptococcus infections in mice. It is a colorless compound that merits further study.—O. V. HYKES, D. E. HYKES and J. RERABEK. *Compt. rend. soc. biol.*, 126 (1937), 635–637; through *Chimie & Industrie*, 39 (1938), 1155. (A. P.-C.)

Antiparasitic Products—Industrial Development in. A review.—R. RONDELEUX. *Compt. Rend. XVII Cong. Chim. Ind.* (1937), 71–79; through *J. Soc. Chem. Ind.*, 57 (1938), 1087. (E. G. V.)

Antipneumococcus Sera—Characteristics of, Produced by Various Animal Species. Some 13 mammalian species were immunized against pneumococci and the characteristics of the resulting antisera studied. The characteristics of the serum of each species fell into one of two groups, of which horse serum was the prototype for one group and rabbit serum the prototype of the other. After extraction of the lipids from the sera of both groups, agglutinins and precipitins disappeared but the protective potency was unaltered. If more than the optimum amount of horse serum is injected therapeutically, its protective power is completely lost; while there is no loss of protective power of rabbit antisera regardless of how much is used. By ultrafiltration methods it was shown that the globulin in horse antiserum is about four times the size of the rabbit globulin. Various fractions of horse antibody globulin may vary as much as seven-fold in protective power; while rabbit antiserum shows no variation. One gram of horse antibody globulin possesses half

the protective power of a similar quantity of rabbit antibody globulin. Rabbits may be hyperimmunized in one-tenth the time required for horses. On the basis of the above advantages of rabbit antiserum over horse serum, 67 patients with pneumococcus pneumonia were treated with rabbit antiserum. The antiserum was not effective in 13 of the patients with a type III infection. Out of the remaining 54 patients having a type I, II, V, VII, VIII, XIV or XVIII infection, only two died, indicating a case fatality rate of 3.7%. The chill-producing substance in rabbit antisera was largely removed by heating the serum at 56° C. for three minutes and then absorbing it with sterile kaolin.—F. L. HORSFALL, JR. *J. Bact.*, 35 (1938), 207. (T. C. G.)

Bacterial Cultures—Preservation of. Three general methods have been employed in the past to preserve bacterial cultures over long periods, *viz.*, sealing the culture tubes, covering cultures with sterile oil and drying. Each of these methods was tried on a large number of cultures for various periods up to five years. The method of sealing culture tubes was criticized because the cultures did not remain viable very long and the cultural characteristics of the surviving organisms are frequently changed. The freezing and drying method is objected to because it requires expensive apparatus and is time-consuming; although the cultures remain viable over long periods and their original cultural characteristics are usually unchanged. The method of choice is simply adding sterile mineral oil to cover the growth on an agar slant and storing it in the ice box. This method is simple, inexpensive and most cultures remain viable for at least a year without transfers.—H. E. MORTON and E. J. PULASKI. *J. Bact.*, 35 (1938), 163. (T. C. G.)

Bacterial Infections—Remedies for. A bacteriostat for treating, for example, pyogenic infections is prepared by dissolving chlorophyll in (*a*) isotonic salt solution (0.05%) and (*b*) a salve-forming medium, for example, "lanolin" or petroleum jelly (0.7%).—LAKELAND FOUNDATION, assignees of B. GRUSKIN. Brit. pat. 486,756 and 486,847; through *J. Soc. Chem. Ind.*, 57 (1938), 1102. (E. G. V.)

Benzoic Acid and Inorganic Salts—Effect of p_H on Antiseptic and Bactericidal Action of. The maximum dilutions at which benzoic acid solutions function effectively as bactericidal or bacteriostatic reagents were determined at various p_H values. Benzoic acid is not an effective bactericidal or bacteriostatic agent in the neutral range. The p_H at which the dilution-p_H curve breaks is, for both organisms, approximately 4.4 for bactericidal action and an average of 6.1 for bacteriostatic action. Benzoic acid is almost equally effective bactericidally against both organisms but is less effective against *Staphylococcus aureus* than against *Bacterium coli* when bacteriostatic action is considered. The effectiveness of sodium benzoate as a preservative depends largely, then, upon the acidity of the medium in which it is used. It is relatively ineffective in neutral or alkaline solution but decidedly effective when converted to the free acid by the acidity of the media. Solutions of sodium chloride, potassium chloride, sodium nitrate and sodium sulfate were prepared at p_H values of 4, 5, 6, 7 and 8. None of these solutions were effective as bactericides, showing that a high concentration of either chloride or sodium ion is necessary to product bactericidal action.—R. H. GOSHORN, E. F. DEGERING and P. A. TETRAULT. *Ind. Eng. Chem.*, 30 (1938), 646–648. (E. G. V.)

Diphtheria Toxin and Anatoxin—Chemical Nature of. Diphtheria anatoxin has been obtained as a pure substance. It is protein in nature and yields no lipide, carbohydrate or nucleic acid derivatives on hydrolysis. One unit equals 0.003 mg.—A. BOIVIN. *Compt. rend. soc. biol.*, 126 (1937), 218–221; through *Chimie & Industrie*, 39 (1938), 1153. (A. P.-C.)

Food Poisoning—Alpha Type Streptococci in. A large institutional outbreak of food poisoning in which diarrhea was the outstanding symptom occurred among 117 out of 208 young men. The incriminated food was beef croquettes from which enormous numbers (28,000,000 per Gm.) of alpha type streptococci were isolated. Seven human volunteers drank up to 20 cc. each of the filtrate from the organisms but none developed any evidence of illness. However, when living broth cultures of the organism were swallowed, five of the seven volunteers developed abdominal distress within 12 hours.—W. E. CARY, G. M. DACK and E. DAVISON. *J. Infect. Dis.*, 62 (1938), 88. (T. C. G.)

Germicidal Preparations. The preparation is claimed of aqueous or aqueous-ethyl alcohol emulsions of *p*-tert-butylphenol or its homologues with other phenols (chloro-phenols, -cresols or -xylenols), which are said to exert a bactericidal effect greater than the sum of the component phenols.—LEHN and FINK PRODUCTS CORP. Brit. pat. 484,228; through *J. Soc. Chem. Ind.*, 57 (1938), 1101. (E. G. V.)

Granuloma Inguinale—Cultural Studies of the "Donovan Bodies" of. Typical Donovan Bodies were isolated from four cases of granuloma inguinale. These bodies were not pathogenic for rats, mice, guinea pigs or rabbits. The Donovan Bodies could not be cultivated even on rich media which support the growth of the gonococcus or Ducrey's bacillus. The Donovan Bodies are not related to the Friedlander group of organisms as reported by other investigators. A healthy volunteer was inoculated with the Donovan Bodies and a typical lesion of granuloma inguinale was produced, indicating, that these bodies are the etiology of granuloma inguinale.—R. B. DIENST, R. B. GREENBLATT and E. S. SANDERSON. *J. Infect. Dis.*, 62 (1938), 112. (T. C. G.)

Hemolytic Streptococci in Human Feces. A study was made of 109 cultures of hemolytic streptococci isolated from 45 samples of feces from normal individuals. The organisms were classified by means of biochemical tests and Lancefield's precipitin technic. The following species of streptococci were isolated in order of their frequency: *Streptococcus zymogenes* (Lancefield group D), the "enterococcus" (group D), *Streptococcus durans* (group D), *Streptococcus mastitidis* (group B), "minute hemolytic streptococci" (group F) and *Streptococcus anginosus* (group G).—F. R. SMITH and J. M. SHERMAN. *J. Infect. Dis.*, 62 (1938), 186. (T. C. G.)

Hemolytic Streptococci in Milk. A total of 313 samples of commercial milk (68 raw and 245 pasteurized) were examined for the presence of hemolytic streptococci. Broad-zone hemolytic streptococci were isolated from 8.5% of the pasteurized milk samples and 18% of the raw milk samples. The cultures isolated were identified by biochemical tests and by Lancefield's precipitin test. The following types of streptococci were isolated: *Streptococcus mastitidis*, *Streptococcus durans* and *Streptococcus zymogenes* as well as two other types which could not be classified according to any hitherto described species of streptococci.—J. M. SHERMAN and C. F. NIVEN. *J. Infect. Dis.*, 62 (1938), 190. (T. C. G.)

Indole—Growth-Inhibiting Action of, on Bacteria. There was no difference in indole resistance between milk-souring streptococci (*Bact. acetylcholini* Keil) isolated from milk and those from feces. There was no difference in resistance between *B. coli*, enterococci and spore-forming anærobes from the intestine, or between indole-forming and indole-negative strains of *coli*. Hence, indole is not important in the intestinal canal. Indole has a distinctly stronger inhibiting action than phenol.—H. BAUGHKNECHT. *Zbl. Bakt. Parasitenk. I*, 140 (1937), 101–105; through *Chimie & Industrie*, 39 (1938), 938. (A. P.-C.)

Inhibiting and Antiseptic Powers of Volatile Oils. The numbers of organisms and their p_H after 1, 3, 5 and 8 days for the infusions of 21 drugs containing volatile oils are given in a table. The p_H of fresh infusions generally lies between 6–7; old infusions show a shift to the alkaline side with an increase in the number of organisms. The volatile oil contents are also reported. The agar-cup method was used in determining the sterile and inhibiting zones produced in cultures of staphylococci and *B. typhosus*. Drugs rich in volatile oils showed, in general, no greater antibacterial action than those poorer in oil. Oils of eucalyptus, marjoram, turpentine and tansy show strong inhibiting and antiseptic powers. Tooth pastes and mouth washes, which contain volatile oils were found not to kill staphylococci at 37° C. within six minutes. Definite mixtures of volatile oils have poorer inhibiting actions than the individual oils. Many oils especially caraway, lavender, tansy and turpentine killed staphylococci preparations when placed 1.5 cm. from them and especially *B. typhosus* which was on or in an agar layer 1.5 cm. thick. The antibacterial action of volatile oils is weaker in cultures in air-tight conditions than when air is admitted.—H. KLIEWE and C. K. HUTHMACHER. *Deut. Apoth. Ztg.*, 53 (1938), 952–955. (H. M. B.)

Intravirus Infections—Study of the Action of Various Chemicals on Some. A study of the action of aqueous solutions of tannin, soda alum, sodium salt of dibromohydroxymercurifluoresceine and picric acid on the ultraviruses of herpes, American encephalitis and avian plague. The substances studied exerted no protective action whatever against herpeto-encephalitic virus administered nasally to rabbits nor against avian plague virus inoculated into mice in the same manner. In the case of American encephalitis in mice, the sodium salt of dibromohydroxymercurifluoresceine exerted a marked protective action, and soda alum even more so. In previous experiments both these salts seemed to exert some action on the experimental poliomyelitis of monkeys. Picric acid solutions, either alone or with soda alum, are entirely ineffective.—P. HABER. *Compt. rend. soc. biol.*, 126 (1937), 672–673; through *Chimie & Industrie*, 39 (1938), 1154–1155. (A. P.-C.)

Parasiticides—Physical Property of. The mechanism of the action of wetting agents used in spray preparations is discussed.—F. BARILLET and A. CHOISNARD. *Compt. rend. XVII Cong. Chim. Ind.*, (1937), 530–534; through *J. Soc. Chem. Ind.*, 57 (1938), 1087. (E. G. V.)

Phenol and Sec-Amyltricresol—Effect of Salts on the Germicidal Action of. In concentrations of 2% and 10% NaCl, $BaCl_2$, $FeCl_2$, $FeCl_3$, $NaNO_2$, Na_3PO_4, $(NH_4)_2HPO_4$, $CoCl_2$, $KMnO_4$, LiCl, NH_4Cl, Na_2HPO_4, KH_2PO_4, $Fe_2(SO_4)_3$ and $CuSO_4$ were added to phenol and sec-amyltricresol. Using *Staphylococcus aureus* and *Escherichia coli* as test organisms, a "disinfectant coefficient" was determined for each salt with phenol or sec-amyltricresol. The disinfectant coefficient was defined as "the ratio of the greatest dilution of disinfectant plus salt, killing the test organisms in 10 minutes but not in 5, to the greatest dilution of disinfectant alone showing the same results." In general most salts showed little effect on the germicidal power of the disinfectant. However, $CuSO_4$, $Fe_2(SO_4)_3$ and $Fe_2(SO_4)_3.(NH_4)_2SO_4$ with sec-amyltricresol produced higher disinfectant coefficients than the other salts. The effect of p_H was controlled by adding HCl or H_2SO_4 to the disinfectants in check tubes; but the germicidal action of the salts could not be accounted for on the basis of p_H change alone. Certain salts showed a specificity of action toward *S. aureus* or *E. coli*.—H. W. LUNDY. *J. Bact.*, 35 (1938), 633. (T. C. G.)

α-Phenylalkanoic Acids—Preparation of, and a Study of Their Bactericidal and Physical Properties. The purpose of the study was to determine effect of hydrogen-ion concentration on antiseptic and bactericidal action of a series of phenylalkanoic acids and to see if there is relation between structure and bactericidal action. Alpha- and omega-phenylalkanoic acids were prepared and tested. It was found that the bactericidal properties are rather closely correlated with p_H of the media. A correlation exists between the oil-water distribution coefficients and the bactericidal properties of the acids. Bactericidal action may be related to adsorption. The omega-phenyl-alkanoic acids are less soluble and have slightly higher oil-water distribution coefficients that the corresponding alpha-alkanoic acids. The difference between the omega-phenyl substituted acids and the alpha-phenyl substituted acids as compared with phenol is neither marked nor consistent.—R. H. GOSHORN and Ed. F. DEGERING. *J. Am. Pharm. Assoc.*, 27 (1938), 865. (Z. M. C.)

Serums—Therapeutic, Different Forms of Sulfur in, and a Simple Method of Determining Inorganic Sulfur. Total sulfur is determined by Revol's method (*Bull. Soc. Chim. Biol.*, 77 (1935), 1451–1454). Nonprotein sulfur is the total sulfur found in the trichloroacetic acid filtrate. To determine inorganic sulfur (sulfates) triturate 10 cc. of serum with 10 cc. of a solution containing 5 Gm. of mercuric chloride dissolved in 100 cc. of 2% hydrochloric acid. Filter after 30 minutes, evaporate 10 cc. of filtrate to 3 to 4 cc., neutralize, dilute to 5 cc. and determine sulfate sulfur by precipitating with benzidine in acetone. Antidysenteric, antidiphtheric and antitetanue (horse) serums have similar sulfur contents. Total sulfur is about 1 Gm. per liter, nonprotein sulfur 170 to 210 mg. per liter, and sulfate sulfur 64 to 72 mg. per liter. Horse serum contains less total sulfur and more nonprotein sulfur than human serum.—L. REVOL and L. TROUILLAS. *Compt. rend. soc. biol.*, 126 (1937), 24–25; through *Chimie & Industrie*, 39 (1938), 1079. (A. P.-C.)

Staphylococcic Alum Toxoid. Staphylococcic toxoid was precipitated with 0.5–7.0% potassium alum and stored at 4–8° C. for 18 hours. To some of this alum toxoid rochelle salt solution was added to dissolve the precipitate. Rabbits and horses were immunized with the plain toxoid, alum precipitated toxoid and the alum precipitated toxoid dissolved with rochelle salt. The alum precipitated toxoid produced two to five times more antitoxin than the plain toxoid, and the toxoid dissolved with rochelle salt had antigenic properties intermediate between the plain and alum toxoid.—L. N. FARRELL and J. S. KITCHING. *J. Immunol.*, 34 (1938), 51. (T. C. G.)

Staphylococcic Toxoid—Stability and Antigenicity of. Staphylococcic toxoid was prepared by adding varying amounts of formalin (0.05 , 0.01, 0.2, 0.3, 0.5 and 1.0%) to toxin formed by the Wood 46 strain. The rate of detoxication was directly proportional to the amount of formalin added—26 days with 0.05% and 1 day with 1.0% at 37° C. When the combining power of the toxoid with antitoxin was determined, it was found that the combining power decreased as larger amounts of formalin were used in preparing the toxoid. There was little loss of potency of the toxoid when stored in the refrigerator for 15 months regardless of the amount of formalin added. The antigenicity of the toxoid was determined by immunizing rabbits and titrating the resulting

antitoxin in their sera. The highest concentrations of antitoxin were found in those rabbits injected with toxoid containing the greatest amount of formalin, *i. e.*, the toxoids which had been detoxified the most rapidly. Toxoid diluted 1:5 and 1:10 with saline or broth was as stable on storage at 4–8° C. as the undiluted toxoid.—J. S. KITCHING and L. N. FARRELL. *J. Immunol.*, 34 (1938), 1. (T. C. G.)

Tuberculin "O. T."—Diluent for Stabilizing, in Diluted Form for the Mantoux Test. A diluent for "O. T." tuberculin diluted 1:10,000 for the Mantoux test was sought which would preserve the potency of the product against light, shaking, air, glass, etc. After testing many diluents the following was found satisfactory: A solution of borax and boric acid buffered to p_H 7.2 containing 0.04% gum arabic and 0.5% phenol. Twenty different samples of tuberculins from different parts of the world were diluted 1:10,000 with this diluent and incubated at 37° C. for 35 days. When tested on sensitized guinea pigs, none of these tuberculins showed any appreciable loss in potency. It is believed that the diluted tuberculin will remain potent for considerably longer periods than 35 days if it is stored at refrigerator temperatures.—R. GOTTSCHALL and W. E. BUNNEY. *J. Immunol.*, 34 (1938), 103. (T. C. G.)

Vipera Aspis Venom—Detoxification of, by Sodium Ricinoleate and the Immunization of Rabbits by Detoxified Venom. The venom in 1:1000 aqueous solution was detoxified by adding sodium ricinoleate (1:600 to 1:800) to the solution and incubating 24 hours at 37° C. The product retained most of its antigenic properties and produced a fair degree of immunity when injected several times into rabbits.—E. CESARI and P. BOQUET. *Compt. rend. soc. biol.*, 126 (1937), 570–572; through *Chimie & Industrie*, 39 (1938), 1155. (A. P.-C.)

BOTANY

Arsenical Products for Agricultural Use. The general properties of the principal insoluble arsenic insecticides are summarized.—J. W. BULGER. *J. Econ. Entom.*, 30 (1937), 689–693; through *J. Soc. Chem. Ind.*, 57 (1938), 1087. (E. G. V.)

Boron Deficiency in Plants. Experiments with Vicia Faba. Effects of deficiency of boron on *Vicia faba* are described and relationships between boron and "chocolate spot" disease are discussed.—J. DUFRENOY. *Compt. Rend. XVII Cong. Chim. Ind.* (1937), 746–751; through *J. Soc. Chem. Ind.*, 57 (1938), 1086. (E. G. V.)

Cereals—Origin of, Especially Wheat. A discussion with sixteen references.—WALTHER VON STOKAR. *Deut. Apoth. Ztg.*, 53 (1938), 970–973. (H. M. B.)

Lignified Constituents—Detection of, in Plants. The test for lignin by means of a solution of 2,6-diaminopyridine in concentrated hydrochloric acid (blood-red coloration) can also be used for detecting lignified constituents in powdered vegetable drugs. The reagent when mixed with an equal volume of glycerin does not lose its sensitiveness after 14 days.—H. PATZSCH. *Pharm. Zentralhalle*, 78 (1937), 3; through *Chimie & Industrie*, 39 (1938), 933. (A. P.-C.)

Mushrooms—Identification of, and Some Other Fungi Destructive to Wood. The following are described: *Merulius lacrimans, Poria (Polyporus) vaporar., Polyporus destructor, Lencites sepiaria, Lentinus squamosus* and *Cornophora cerebella.*—G. FRIESEN. *Deut. Apoth. Ztg.*, 53 (1938), 994–995. (H. M. B.)

Nitrogen—Application of the Kjeldahl Method to the Study of the Binding of, by Leguminous Seeds during Germination. It is pointed out that correct values in the Kjeldahl determination are obtained only if the heating is continued 20–30 minutes after the mixture has become clear. Germinated seeds have a higher nitrogen content than ungerminated ones, which is attributed to the assimilation of atmospheric nitrogen.—V. SADASIVAN and A. SREENIVASAN *Biochem. Z.*, 296 (1938), 434–442; through *Chem. Abstr.*, 33 (1939), 199. (F. J. S.)

Is Plant Growth Influenced by the Moon? II. Effects of moonphase on germination and growth of plants are examined.—H. JAEGER. *Bodenk. Pflanzenernahr.*, 7 (1938), 19–56; through *J. Soc. Chem. Ind.*, 57 (1938), 1086. (E. G. V.)

Plants—Preparing Triturations of Fresh. Fresh medicinal, etc., plants are triturated in the presence of amyloses and/or polyamyloses, with or without addition of buffer salts or mixtures giving an alkaline reaction, and are then dried at not more than 30° with air of preferably slowing decreasing moisture content. This procedure is said to reduce trituration losses.—G. F. and H. MADAUS (DR. MADAUS and Co.). Brit. pat. 488,115; through *J. Soc. Chem. Ind.*, 57 (1938), 1232. (E. G. V.)

Potato—Distribution of Ascorbic Acid in. An earlier observation is corroborated that the outside portions of the potato have a much lower ascorbic acid content than the deeper layers.—K. PAECH. *Biochem. Z.*, 298 (1938), 307–311; through *Chem. Abstr.*, 33 (1939), 199. (F. J. S.)

Rice—Storage of. XX. Unhulled Rice Stored about One Hundred Years in a Granary. Unhulled rice kept for 100 years was much spoiled by *Rhizopertha dominica;* hulled rice was darker in color and had a peculiar odor, but was edible though unpleasant. Fat, glucose and dextrin had decreased and, with the exception of lipase activity, the enzyme activity was greatly reduced. Only 8.2% of vitamin B_1 was retained. Germinating power was entirely lost.—M. KONDO and T. OKAMURA. *Ber. Ohara Inst. landw. Forsch.*, 8 (1938), 47–52; through *J. Soc. Chim. Ind.*, 57 (1938), 1220. (E. G. V.)

Rubber Paraffin—Double Embedding Method for. To 200 Gm. of paraffin add 2 Gm. of rubber and 0.5 Gm. of beeswax. Heat at 105° for 16 hours with occasional stirring. The most suitable rubber was "Heveatex" which is 37% rubber latex in aqueous solution with a small amount of ammonium hydroxide as a preservative. It is air-dried in thin layers and cut into small pieces. The method is superior to paraffin for any tissue which varies in density. For trichrome staining it is excellent, since it permits cutting the entire specimen without fraying. Specimens can be reëmbedded in celloidin.—E. M. BEYER. *Am. J. Clin. Path.*, Tech. Suppl., 2(1938), 173–175; through *Chem. Abstr.*, 33 (1939), 197. (F. J. S.)

Starch—Examination of. Directions are given for the qualitative and quantitative microscopic examination of wheat, barley, rye, oat, corn, rice, arrow root, potato, turmeric and dhurra starches.—F. PUGH. *Microscope*, 2 (1938), 239–242; through *Chem. Abstr.*, 33 (1939), 425. (F. J. S.)

Vitamin C—Condition of, in Plants. An aqueous extract of horseradish, separated from the pulp by a Berkfeld filter, contains a thermolabile factor which stimulates the further destruction of dehydroascorbic acid. This factor is destroyed, if previous to filtration, the chopped horseradish is subjected to the action of oxygen. The passage of oxygen through the filtrate itself (in the absence of the pulp) does not bring about inactivation. The transformation of ascorbic acid to the dehydro-form is effected by the pulp.—M. A. GUDLET and E. K. KARDO-SYSOEVA. *Biokhimya*, 3 (1938), 334–347; through *Chem. Abstr.*, 33 (1939), 198. (F. J. S.)

CHEMISTRY

GENERAL AND PHYSICAL

Alcohol—Determination of, in Pharmaceutical Liquids. The chain hydrometer offers many advantages for determining the alcohol content of distillates. It requires little time and the accuracy is comparable to that of a pycnometer or very sensitive Westphal balance. Alcohol-water temperature charts are given by means of which chain readings at room temperature can be converted to percentage alcohol at the official temperature.—K. BAMBACH. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 541–543. (E. G. V.)

Alcoholic Fermentation—Physical Chemistry of. A survey of the literature.—O. G. DE LIMA. *Rev. chim. ind.*, 7 (1938), 188–193; through *J. Soc. Chem. Ind.*, 57 (1938), 1216. (E. G. V.)

Clay. III. Use of Bleaching Earths in Preparing and Investigating Essential Oils and Perfumes. A detailed account is given of the apparatus and technic for separation of oils by fractional absorption from hydrocarbon solution on clay, with accounts of the results with bergamot, orange, lemon, mandarin, chamomile, pineneedle, citron, eucalyptus, peppermint, clove and cinnamon oils. The importance of the method for purification of peel oils which are unstable for distillation, and for the removal of colored substances is stressed.—H. CARLSOHN and G. MULLER. *Angew. Chem.*, 51 (1938), 466–471; through *J. Soc. Chem. Ind.*, 57 (1938), 1099. (E. G. V.)

Dew Point—Accurate Determination of. The apparatus features sensitive instrumental observation of dew, combined with minimization of systematic errors in the measurement of the temperature at the gas-liquid interface. The technic is such as to eliminate the marked hysteresis error characteristic of methods involving continuous temperature change. An accuracy of ±0.01° is reached.—A. W. HIXSON and G. E. WHITE. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 235–240. (E. G. V.)

Gelatins—Solubility of Lyophile. Report is made of a study of several samples of gelatin, made by the so-called "Lyophile" process which, briefly, consists of rapid freezing of an aqueous solution followed by dehydration of the frozen material under high vacuum. These gelatins dissolve completely and rapidly in water at 25–28° C. A number of other properties are discussed.—L. F. TICE. *J. Am. Pharm. Assoc.*, 27 (1938), 755. (Z. M. C.)

Glass Electrodes—Simple Method for Preparing. A simple procedure for making a very sensitive, durable glass electrode is given. Accurate measurements may be made with this electrode using a portable galvanometer with a sensitivity of the order of 40 megohms and an ordinary galvanometer.—M. L. NICHOLS and J. M. SCHEMPF. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 286. (E. G. V.)

Quinhydrone Electrode—Simplified. Modifications of the quinhydrone electrode, sample vessel, and calomel half-cell are described, in which a plain gold plated platinum wire is substituted for the conventional glass sleeve electrode and in which a sealed-in platinum wire is substituted for a stop-cock in the calomel half-cell. The application of the new electrode and portable half-cell in determining p_H values of liquids and semi-plastic materials is described.—G. F. SANDERS. *Ind. Eng. Chem., Anal. Ed.*, 30 (1038), 274–275. (E. G. V.)

Solvents—Vapor Pressures of. Nomographic charts are given for the following solvents: acetonyl acetone, anisole, benzyl chloride, bromobenzene, isobutyl *n*-butyrate, butyl cellosolve, *n*-butyl lactate, *n*-butyric acid, *n*-butyric anhydride, cellosolve acetate, *o*-chlorotoluene, *m*- and *p*-chlorotoluene, decalin, *o*-dichlorobenzene, dichloroethyl ether, ethyl acetoacetate, 2-ethyl butyl acetate, ethyl lactate, ethylene glycol, ethylidene diacetate, glycol diacetate, hexachloroethane, hexalin, *n*-hexanol, methyl acetoacetate, methyl *n*-amyl ketone, methyl carbitol, monoethanolamine, octyl acetate, octyl alcohol, octyl aldehyde, pentachloroethane, propylene glycol, acetophenone, anethole, benzophenone, benzyl acetate, benzyl alcohol, butyl carbitol, carbitol, carbitol acetate, creosol, dibutyl phthalate, dibutyl tartrate, diethanolamine, diethyl phthalate, diethyl sulfate, diethyl tartrate, diethylene glycol, dimethyl phthalate, diphenyl oxide, 4-nitro-1.3-xylene, *o*-nitrotoluene, *m*-nitrotoluene, *p*-nitrotoluene, terpenyl acetate, terpineol, tetraline, triacetin, trichlorobenzene, triethanolamine, triethylene glycol.—D. H. KILLEFFER. *Ind. Eng. Chem.*, 30 (1938), 565–567. (E. G. V.)

Specific Gravity Measurements—Elimination of Surface Tension Effects in. In determining the specific gravity of water and solution of high surface tension by means of a Westphal balance, uncertainty may result owing to surface tension effects that act on the wire that supports the plummet. If a small drop of approximately 1% solution of sodium lauryl sulfate is added to the surface of the aqueous solution in the measuring cylinder after the immersion of the plummet of the balance, the difficulty is overcome. With pure water the meniscus at the wire will move in the same direction as the plummet, but after the addition of the surface tension depressant, the plummet can be raised and lowered at will without visible alteration of the meniscus at the wire; this indicates its complete wettability.—C. H. M. ROBERTS. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 518–519. (E. G. V.)

Viscosity Measurement. Viscosity and viscosity temperature coefficients are valuable identifying properties of pure compounds and petroleum fractions. Modified Ostwald viscometers suitable for covering a wide range of viscosity with accuracy are described.—M. R. CANNON and M. R. FENSKE. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 297–301. (E. G. V.)

INORGANIC

Calcium—Precipitation of, in the Presence of Ammonium Molybdate and Iron. Both calcium and phosphorus are determined on the same charge. Calcium may be accurately determined by precipitating it as the oxalate and titrating with potassium permanganate after removing the phosphorus as ammonium phosphomolybdate. Moderate amounts of iron do not interfere. Ammonium molybdate does not interfere with the quantative precipitation of calcium in the presence of a moderate amount of acetic acid and ammonium oxalate.—R. C. WILEY and A. YEDINAK. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 322–323. (E. G. V.)

Fluorine—Removal of, from Water. A development in the use of tricalcium phosphate.—A. S. BEHRMAN and H. GUSTAFSON. *Ind. Eng. Chem.*, 30 (1938), 1011–1013. (E. G. V.)

Potash—Symposium on. A group of papers on the occurrence, production, use, etc., of potassium and its salts.—*Ind. Eng. Chem.*, 30 (1938), 853–896. (E. G. V.)

Water—Removal of Iron from, and Two Methods of Purifying. Certain synthetic phenolic and tannin resins remove calcium and magnesium as effectively as the customary water-softening agents. Resins from aromatic bases (for example, aniline resin) remove anions. A preparation which removes iron is recorded.—ANON. *Text. Manuf.*, 62 (1936), 154; through *J. Soc. Chem. Ind.*, 57 (1938), 1240. (E. G. V.)

ORGANIC

Alkaloids

Arundo Donax L.—Alkaloids of. In agreement with Euler, Erdtman and Hellström, donaxine and gramine were proved to be identical.—A. P. OREKHOV and S. S. NORKINA. *J. Obchtch. Khim.*, 7 (1937), 673–675; through *Chimie & Industrie*, 39 (1938), 1150. (A. P.-C.)

Cocaines—Determination of, in Coca Leaves. The Health Organization of the League of Nations recommends that ether-soluble ecgonine alkaloids be determined by taking 45 cc. of the solution of the bases in 0.1*N* hydrochloric acid, adding sodium bicarbonate and shaking the solution three times with a mixture of two parts ether and one part gasoline. This method is criticized particularly with respect to the fact that sodium bicarbonate does not liberate the alkaloids as readily as sodium carbonate does and ether alone is better than a mixture of gasoline and ether for dissolving the liberated alkaloids.—A. W. K. DE JONG. *Rec. trav. chim.*, 57 (1938), 1218–1222; through *Chem. Abstr.*, 33 (1939), 810. (F. J. S.)

Coffee—Determination of Caffeine in. A modified method is described in which coffee in water is treated with calcium oxide, and the extract purified with aluminum acetate and then with potassium permanganate, after which the caffeine is extracted from the dried product by carbon tetrachloride, and then by chloroform, and weighed.—G. SCOTTI. *Boll. chim.-farm.*, 77 (1938), 403–405; through *J. Soc. Chem. Ind.*, 57 (1938), 1225. (E. G. V.)

Convolvulus Pseudocantabricus—Alkaloids of. The four following alkaloids were isolated from this plant: (1) convolvine, $C_{16}H_{21}NO_4$, colorless prismatic crystals melting at 115° C.; (2) convolamine, $C_{17}H_{23}NO_4$, prismatic crystals melting at 114° to 115° C.; (3) concolvidine, which differs from the first two by its high melting point (192° to 193° C.) and low solubility in the usual organic solvents; it probably has the double formula $C_{33}H_{42}N_2O_8$ or $C_{33}H_{44}N_2O_8$; it is present only to the extent of 2.5% of the total alkaloids; (4) convolvicine, melting point 250° to 260° C., with probable formula $C_{10}H_{16}N_2$.—A. P. OREKHOV and R. A. KONOVALOVA. *J. Obchtch. Khim.*, 7 (1937), 646–653; through *Chimie & Industrie*, 39 (1938), 1150. (A. P.-C.)

Cytisus Caucasicus—Alkaloids of. The plant contains 0.4% of total alkaloids. There are three different alkaloids. The chief one is identical with *d*-lupanine, $C_{15}H_{24}N_2O$. The second has a composition corresponding to the formula of pachycarpine; it is present in small amounts only. The third consists of crystals melting at 120° to 121° C., but it is present in such small quantities that it could not be analyzed.—A. P. OREKHOV and S. S. NORKINA. *J. Obchtch. Khim.*, 7 (1937), 743–746; through *Chimie & Industrie*, 39 (1938) (A. P.-C.)

Cytisus Ratisbonensis—Alkaloids of. This plant contains 0.16% of total alkaloids on the dry basis, consisting of *l*-lupanine and *l*-sparteine in proportions which vary according to the stage of vegetation: plants harvested in May contain chiefly *d*-lupanine and only traces of sparteine; in August the total alkaloids contain 3% sparteine and 70% lupanine. *d*-Lupanine was isolated in both the liquid and crystalline states; the liquid has a lower rotation than the crystals, which may be due to partial racemization.—S. S. NORKINA and A. P. OREKHOV. *J. Obchtch. Khim.*, 7 (1937), 853–856; through *Chimie & Industrie*, 39 (1938), 1151. (A. P.-C.)

Ergot—Microscopic Examination of Some Alkaloids of. The purpose of this work was to examine the derivatives of ergotamine and ergotaminine from a physical standpoint. The addition derivatives of ergotamine were extracted with acetone, water, alcohol, methyl alcohol, pyridine, benzol, dichlorethylene and ether. The application of a little heat was necessary for all these solvents and in almost all the cases the addition products separated out in needle-like crystals. The solution from which the crystals separated out with difficulty was water; however good crystals were obtained when, during the crystallization process, the temperature of the water was kept a little higher than for the rest of the solutions. All these molecular derivatives (except the ether solvent from which no crystals were obtained) crystallized in sphenoidal masses. Furthermore, the crystals obtained from acetone, water, pyridine, alcohol and methyl alcohol were of the monoclinic-sphenoidal type; those from dichloroethylene and benzol were of the rhom-

boidal-bisphenoidal type. During the reaction some of the derivatives lose some of their properties; the derivatives from alcohol and methyl alcohol seem to be the more stable, especially concerning the optical relationship. The most important data on these derivatives can be tabulated as follows: *Ergotamine-water-acetone derivative:* m. p. 172–174°, monoclinic prisms, refractive index of the rectangular crystals, $\alpha' = \beta = 1.580$, $\nu' = 1.621$, of the hexagonal crystals, $\alpha' = 1.540$, $\nu' = \beta = 1.580$. *Ergotamine-water derivative:* m. p. 174–176°, small leaf-like crystals, optically negative, refractive index, $\alpha' = 1.600$, $\nu' = \nu = 1.660$. *Ergotamine-pyridine derivative:* m. p. 172–176°. The crystals of this derivative are isomorphic with those of the acetone derivative, refractive index, $\alpha' = \beta = 1.604$, $\nu' = 1.640$. *Ergotamine-benzol derivative:* m. p. 168–172°, short prisms, refractive index, $\alpha = 1.545$, $\beta = 1.616$, $\nu = 1.635$; optically negative. *Ergotamine-ether derivative:* m. p. 183–185°, fine needles. *Ergotamine-methyl alcohol derivative:* m. p. 208–210, optically positive, refractive index, $\alpha' = 1.595$, $\beta - 1.610$, $\nu = 1.660$, $\nu' = 1.648$. *Ergotamine-alcohol derivative* separates out in fine needles: m. p. 172–175°, optically positive, refractive index, $\alpha' = \beta = 1.620 + \nu' = 1.652$. *Ergotamine dichloroethyl derivative:* m. p. 182–186°, separates out in short prisms. Because of their rapid decomposition, the refractive index of these crystals is very difficult to ascertain. Attempts made to obtain a derivative from the ergotamine-chloroform mixture was met with little success. The ergotaminine compound crystallizes from pyridine, acetone, chloroform, alcohol and dichloroethylene in similar monoclinic sphenoidal crystals, mostly in triangular or deltoid shapes; refractive index, $\alpha' = 1.590$, $\nu' = \beta = 1.655$, optically positive. The decomposition of the crystals occurs at 235–240°.—A. KOFLER. *Chem. Zentralb.*, 108 (1937), 1947. (G. B.)

Genista Tinctoria—Alkaloids of. The plant yielded 0.33% of total alkaloids (on the dry basis) in the form of a resinous mass. By means of double fractionation there were isolated: a base melting at 95° to 96° C., and the alkaloids cytisane, methylcytisane and anagyrine. The plant contains no sparteine.—S. S. NORKINA, T. NARKOUZIEV and A. OREKHOV. *J. Obchtch.*, 7 (1937), 906–910; through *Chimie & Industrie*, 39 (1938), 1151. (A. P.-C.)

Narcotics—Control of Manufacture of. Determination of Ecgonine and Its Derivatives in Residues from Cocaine Manufacture. Ecgonine is determined as the platini-iodide, $(C_{10}H_{15}O_3N,HI)_2PtI_4$, melting point 227°, insoluble in acetic acid. Derivatives of cocaine and ecgonine, if present, are converted into ecgonine by refluxing with 10% hydrochloric acid.—A. TORRICELLI. *Mitt. Lebensm. Hyg.*, 29 (1938), 48–53; through *J. Soc. Chem. Ind.*, 57 (1938), 1099. (E. G. V.)

Opium—Alkaloids from, Chromatographic Study of. The analyses were concerned with morphine (I), codiene (II), narcotine (III) and papaverine (IV), and were based on the general scheme of Karrer and Nielsen (cf. *C. A.*, 31, 6531[6]) for separating quinine and cinchonine and of Zechmeister and Kolnoki (cf. *C. A.*, 32, 4327[6]) in their chromatographic studies of cellulose acetate. In Wood light I, II, III and IV give pale violet, dark violet, yellow-gray and silver-white colors, respectively. As a result of the experiments, the chromatographic data of which are recorded in detail, the following scheme of separation of the alkaloids was developed: zone (1), resin + I; zone (2), I; zone (3), I + II mixture + III; zone (4), II mixture + III; zone (5), II mixture + III + IV; zone (6), IV; zone (7), IV; zone (8), absence of alkaloids. With this method it is possible to separate I initially and IV as a final product. II and III are absorbed in the intermediate stratum, II tending to accumulate in the higher part; there is, however, no sharp separation between II and III. The stratum of I is visible in ordinary light and better in Wood light; that of IV is visible only in Wood light.—G. R. LEVI and F. CASTELLI. *Gazz. chim. ital.*, 68 (1938), 459–470; through *Chem. Abstr.*, 33 (1939), 808. (F. J. S.)

Opium—Determination of Morphine in, by the I. P. V. Method. The yield of precipitated alkaloid is an optimum with contact periods of 24, 18 and 12 hours for maceration periods of 1, 5 and 10 hours, respectively.—C. FASANO. *Boll. chim.-farm.*, 77 (1938), 460–463; through *J. Soc. Chem. Ind.*, 57 (1938), 1229. (E. G. V.)

Ungernia Sewerzowii (Rgl.) Fedsch.—Alkaloids of. There was isolated from this plant an alkaloid, "ungernine" which seems identical with tazettine isolated by Spaeth from *Narcissus tazetta*. It is found mainly in the surface skin of the bulbs which contains 0.11% of ungernine (on the weight of the dry bulb), while the inside of the bulb contains only 0.067%. Ungernine contains two methoxyl and two hydroxyl groups. The elementary composition corresponds to the formula $C_{39}H_{44}O_{11}N_2$.—S. S. NORKINA and A. P. OREKHOV. *J. Obchtch. Khim.*, 7 (1937), 902–905; through *Chimie & Industrie*, 39 (1938), 1151. (A. P.-C.)

Essential Oils and Related Products

Allium Scorodoplasm L. var. Viviparum Regel—Constituents of. II. Essential Oils (Preliminary). Three fractions are identified, namely propylallylsulfide, diallyldisulfide and diallyltrisulfide, but propylallylsulfide b_{16} 66–69° reported by others could not be obtained.—A. ABE and M. INAKIVI. *J. Oriental Med.*, 28 (1938), 1257–1261 (German abstr. 97); through *Chem. Abstr.*, 33 (1939), 318. (F. J. S.)

Citronella Derivatives. A review and brief description of the isolated and synthetic materials from Java citronella oil including: citronellal-dimethyl acetal, citronellal-diethyl acetal, pulegol, isopulegol, geranyl formate, acetate, propionate, butyrate, isobutyrate, valerianate, anthanillate, benzoate and methyl ether; citral, citronellyl formate, acetate, propionate, butyrate, isobutyrate, valerianate, benzoate and cinnamate.—R. FORNET. *Seif. Ztg.*, 64 (1937), 131; through *Am. Perfumer*, 36 (1938), No. 2, 34. (G. W. F.)

Coriander Essential Oil—Recovery of, at the Alexeevski Factory. Coriander seed husks are used in place of active carbon for adsorption of the oil.—M. L. MEZINOVA. *Maslob. Zhir. Delo*, No. 3 (1938), 22–23; through *J. Soc. Chem. Ind.*, 57 (1938), 1099. (E. G. V.)

Oil of Oak Moss. The yield of ether extract from oak moss (*Evernia prunastri*) collected in different localities varied 1:3 and the composition of the extracts differed. The analyses were made by combining the two methods of (*a*) extraction with ether of large quantities of moss involving collection in a wide area, when owing to the variable composition, the number of constituents in the extract was increased, and (*b*) using smaller quantities of moss from chosen trees and identifying the particular constituents of the extract. Separation of the constituents of concrete oils from 12 batches of moss into groups according to their physical and chemical properties showed the odor to be concentrated in the small neutral fraction (about 0.8 Gm. per Kg. of air-dried moss, of which 0.4 Gm. is volatile). In addition to vegetable fats, resins, etc. (of no odor value) and other incompletely identified compounds the following occurred: phenol, orcinol methyl ether, thujone, naphthalene, borneol, camphor, cineole, citronellol, geraniol, vanillin, nonyl methyl ketone, stearaldehyde.—M. STOLL and W. SCHERRER. *Compt. rend. XVII Cong. Chim. Ind.* (1937), 205–212; through *J. Soc. Chem. Ind.*, 57 (1938), 1099. (E. G. V.)

Glycosides, Ferments and Carbohydrates

Allium Scorodoplasm L. Var. Viviparum Regel—Consitituents of. I. Alcohol-Precipitated Carbohydrate. Scorodose is not inulin as claimed by Kurozawa, but is tetrafructan as stated by Kihara (cf. *C. A.*, 28, 5097[4]). It has $d_4^{25} = 1.327$–1.388, lower than that of inulin; $[\alpha]_D^{22°} = -41.0°$; and its acetyl derivative has $[\alpha]_D^{21} = -30.7°$. Its molecular weight is 658, slightly lower than a theoretical.—A. ABE and M. INAKIVI. *J. Oriental Med.*, 28 (1938), 1011–1026 (German abstr. 75–77); through *Chem. Abstr.*, 33 (1939), 318. (F. J. S.)

Cardiac Glucosides—Genuine. Glucosides discussed include those of *Scilla maritima*, *Digitalis lanata*, *Digitalis purpurea* and *Strophanthus kombé*. Cardiac glucosides are composed of an aglucon fraction and a sugar fraction; the aglucon is the source of the cardiac action and the sugar determines the solubility in water. Formulæ of the aglucons of strophanthidin, digitoxigenin, gitoxigenin, digoxigenin, periplogenin, sarmentogenin, uzarigenin and oubagenin differ very little; scillaridin A possesses one more carbon atom than the others. Aglucons are related to sterols and bile acids and some of these relations are shown. Formulæ of some of the sugars are shown for comparison. Glycolytic enzymes cause transformation of cardiac glucosides existing in the plant to others so that action of the drug differs from the pure product isolated. The author discusses the chemistry of this action and explains his work on isolation of the initial cardiac glucosides. By means of tables and discussion the following are shown: the hydrolysis of scillaren A, the interrelationship of the lanata and purpurea glucosides, digitalis glucosides arranged in the order of their aglucon and their sugar content, strophanthus glucosides and some related cardiac glucosides, hydrolyses of K-stropanthosid, toxicity of digitalis glucosides.—ARTHUR STOLL. *J. Am. Pharm. Assoc.*, 27 (1938), 761. (Z. M. C.)

Cardiotonic Glucosides: Digitoxin, Strophanthin-K, Ouabain and German Digitalin—New Differential Color Reactions of. Digitoxin and strophanthin-K can be identified by means of a solution of 30 Gm. of vanillin in 100 cc. of hydrochloric acid; the former gives an indigo-blue color and the latter a violet-blue. For the identification of ouabain and German digitalin use a reagent consisting of a solution of 0.1 Gm. of dimethylaminobenzaldehyde in 20 cc. of 95%

alcohol to which has been added 4 drops of concentrated sulfuric acid; the test is carried out in acetic acid solution. Ouabain gives an intense violet coloration and German digitalin an eosin red, both colors being soluble in water. Digitonin gives with the second reagent the same color as German digitalin. They are differentiated by means of a solution of 1 drop of saturated bromine water in 20 cc. of sulfuric acid; digitonin gives no color, German digitalin gives a stable cherry-red.—J. A. SANCHEZ. *J. pharm. chim.*, 24 (1936), 549–558; through *Chimie & Industrie*, 39 (1938), 932. (A. P.-C.)

Diastatic Action—Various Aspects of. A review of present knowledge of diastase and of factors affecting its action. The catalytic effect depends on the colloidal nature of the diastase and the starch, which associate. Diastatic activity is affected by the variety of wheat or rye (which also determines the resistance of the starch), growth and harvesting conditions, the presence of water and of minerals, temperature, and p_H. Diastase is found mainly in the germ and aleurone layer of cereals; low extraction flour contains very little. Finely milled flour is more easily attacked by diastase than coarse. Methods of measuring diastatic activity are referred to.—H. KALNING. *Muhlenlab.*, 8 (1938), 35–46; through *J. Soc. Chem. Ind.*, 57 (1938), 713. (E. G. V.)

Papain and Bromelin. Annual importation of papain into the United States is approximately 200,000 pounds values at $1.00 a pound. The latex of the stem, leaves and green *Carica papaya* fruit contains the enzyme. Yields of dried latex are equivalent to 0.1% of the weight of the fruit. The fruit juices are very destructive to the enzyme. Latex from young plants and from mature male trees is rich in papain. The press juice of leaves and stalks contains less of the inhibitory or destructive substances than that of the fruit. The possibility exists of recovering the enzyme from the leaves and stalks of the useless male trees. There is very little difference in the quality of the juice from leaves of different ages on a mature tree, but there is a marked difference in the quantity of juice to be obtained. The juice obtained in a sepro-sieve apparatus is a thick green liquid full of solid particles of tissue. Seventy Gm. of leaf tissue yielded 25 cc. of juice. After centrifugation, 21.5 cc. of clear press juice was obtained. Thus the yield is about 30% of the weight of the leaf tissue. Clarification of the juice and inhibition of the oxidizing processes by which the papain is inactivated are both aided by increasing the acidity to p_H 4.0 with acetic acid, hydrochloric acid or sulfuric acid. The acidified filtered juice contains about 6% solids including 2.6% of reducing substances calculated as dextrose. The total nitrogen content is 0.32% of the juice, equivalent to 2.0% protein. Once acidified and centrifuged, the juice loses its milk-clotting power very slowly. Three methods of preparation of the enzyme are given. Bromelin is the proteolytic enzyme of the pineapple plant and exists in the fruit, leaves and stalks. The enzyme is very similar to papain but, like the latter, is a mixture of several proteolytic enzymes.—A. K. BALLS, R. R. THOMPSON and W. W. JONES. *Hawaii Agr. Expt. Sta., Ann. Rept.*, 1937 (1938), 56–59; through *Chem. Abstr.*, 33 (1939), 809. (F. J. S.)

Pinguicula Vulgaris L. A study of the proteolytic enzyme content of this insectivorous plant. It contains a proteolytic enzyme which has a slow digestive action on casein and which, *in vivo*, may show a slight proteolytic action on other substances. The dried plant contains 0.29% iron. Percolation of 20 Gm. of finely pulverized dried plant (from 200 Gm. of fresh plant) with 95% alcohol containing 3% of concentrated hydrochloric acid, and neutralization of the extract with ammonia yielded a precipitate, soluble in pyridine and in alcoholic picric acid, containing iron which was detected only after ignition. The iron in the fresh plant is probably present as organic iron in the hematoid state. Color tests on dialyzed juice prepared from the fresh plant according to Dernby showed the presence of a glucide which hydrolyzed gradually with the formation of a pentose, probably arabinose which may be the product of hydrolysis of a gum from the glandular secretion of the plant or of the cleavage of a glucoside.—C. MASINO. *Boll. chim.-farm.*, 76 (1937), 92–96; through *Chimie & Industrie*, 39 (1938), 932–933. (A. P.-C.)

Fixed Oils, Fats and Waxes

"Akebi" Seed Oil—Composition of. Hydrolysis of the seed oil (refractive index at 20° 1.4652, density at 20° 0.9326, acid value 6.6, saponification value 254.9, iodine value 78.6, Reichert-Meissl value 49.3) of *Akebia lobata*, Decne. ("Mituba Akebi"), yields acetic acid and fatty acids (palmitic 23, stearic 2, oleic 53 and linoleic acid 22%). The oil from *A. quinta*, Decne. ("Ituituba Akebi"), is similar.—S. KOMORI and S. UENO. *Bull. Chem. Soc. Japan*, 13 (1938), 505–507; through *J. Soc. Chem. Ind.*, 57 (1938), 1186. (E. G. V.)

American Oil Chemists' Society Fat Analysis Committee—Report of. Slight changes in the specification for the beaker and test-tube for use in the Wiley melting point test, and in the wording of the hot plate method for the determination of water in fats, margarine, etc., are recommended.—*Oil and Soap*, 15 (1938), 208; through *J. Soc. Chem. Ind.*, 57 (1938), 1184. (E. G. V.)

Body Fat of He-Goats—Component Fatty Acids and Glycerides of. Goat body fat (tallow) forms a good soap of excellent lathering and detergent properties; the refined fat is also used for edible purposes. The component fatty acids and glycerides of the body fat of he-goats have been determined and the general structure of the glycerides has been deduced. The results are compared with the body fats of the sheep and cattle (including oxen) and with the milk fats of these animals. The component fatty acids of goat tallow consist mainly of palmitic, stearic and oleic acids, together with subsidiary amount of lauric, myristic and arachidic acids. The amounts of these acids do not differ greatly from those in beef and mutton tallows.—D. R. DHINGRA and D. N. SHARMA. *J. Soc. Chem. Ind.*, 57 (1938), 369–370. (E. G. V.)

Deutsche Gesellschaft für Fettforschung—Collaborate Work of. XI. Oil Seed Analysis. The German standard methods and proposed modifications thereof for the analysis of oilseeds are detailed for purposes of study and criticism.—G. GREITEMANN. *Fettu u. Seifen*, 45 (1938), 350–352; through *J. Soc. Chem. Ind.*, 57 (1938), 1185. (E. G. V.)

Fat in Cacao Shells—Amount and Condition of. (A) While fat may not have traveled from the nib into the shells during the hot-air roasting of the cacao examined by Bauer and Seber (*loc. cit.*), it apparently did so in the case of the beans (steam-roasted in large capacity roasters) examined by Fincke; hence different conditions of processing, rather than bad sorting, may account for discrepancies between the results of different observers. (B) Further studies on the point are advocated.—(A) H. FINCKE. *Fette u. Seifen*, 45 (1938), 345–346; (B) K. H. BAUER and L. SEBER. *Ibid.*, 346; through *J. Soc. Chem. Ind.*, 57 (1938), 1184. (E. G. V.)

Fish Liver Oils—South African. The antimony chloride and the spectrophotometric methods indicated that kabeljou (particularly), dogfish, geelbek, stockfish and kingklip livers may contain considerable amounts of vitamin A. The blue values obtained for the oils cannot be correlated directly with the vitamin A content of the oil as determined by spectrophotometric methods. There is a correlation in the case of stockfish between the size of the fish and the blue value of its liver oil.—C. J. MOLTENO. *S. African J. Med. Sci.*, 3 (1938), 86–88; through *Chem. Abstr.*, 33 (1939), 811. (F. J. S.)

Fixed Oil from the Seeds of Nyctanthes Arbortristis Linn.—Chemical Examination of. The kernels formed nearly 56% of the seeds of *N. arbortristis* and gave 14% of oil on extraction with light petroleum. This oil had a density at 30° of 0.9157, refractive index at 30° 1.4675, saponification value 185.5, iodine value (Hanus) 82.24, acetyl value 19.28, acid value 15.75, Reichert-Meissl value 0.1 and unsaponifiable matter 2.4%. Glycerides of linoleic, oleic, lignoceric, stearic and palmitic acids, with probably some myristic acid, were present. Vitamin A, parasitosterol, and a new sterol (named nycosterol) ($C_{22}H_{44}O_2$), analogous to phytosterol, were found. This crystallized from the oil (0.2% of oil) on long keeping and had a melting point 222°, specific rotation +91°.—S. K. VASISTHA. *J. Benares Hindu Univ.*, 2 (1938), 343–348; through *J. Soc. Chem. Ind.*, 57 (1938), 1186. (E. G. V.)

Liver Oils of Some Deep-Sea Fish. A study of four species of fish, (*Antimora rostrata*, *Coelorhynchus productus*, *Macrurus fasciatus* and *Macrurus armatus*), which live at depths of 800 to 1000 meters. The livers weighed from 85 to 250 Gm. and contained from 32 to 53% of oil. The iodine value (Wijs) of the oils varied from 112.8 to 169.3, the unsaponifiable (consisting chiefly of cholesterol) from 0.45 to 4.57%. All the oils gave a positive antimony chloride test. The acids are mostly in C_{18}, C_{20}, C_{22} and C_{24}; palmitic acid, generally quite abundant, is present only in relatively small amount.—M. TSUJIMOTO and H. KOYANAGI. *J. Soc. Chem. Ind. Japan*, 39 (1937), 397B–398B; through *Chemie & Industrie*, 39 (1938), 931. (A. P.-C.)

Moisture Committee of American Oil Chemists' Society—Report of. It is recommended that the Freas forced-draught oven No. 601/233 previously adopted as a tentative standard should be replaced by a standard forced-draught oven (make not specified) which conforms to a standard specification now detailed for functional performance. As a result of reports by A. D. Rich and by C. P. Brenner, the committee recommended that drying intervals of 3 and 4 hours, respectively,

for samples of meal and cottonseed be allowed when the forced-draught oven is used.—*Oil and Soap*, 15 (1938), 211–213; through *J. Soc. Chem. Ind.*, 57 (1938), 1186. (E. G. V.)

Oiticica Oil. The oil from *Licania rigida* seeds has acetyl value 30, acid value 5.04, saponification 187.7, iodine value 152.4, refractive index at 20.5° 1.5158, and contains alphacouepic acid (75.4%), oleic acid (4.21%), stearic acid (5.2%), palmitic acid (6.1%), hydroxyl acids (2.42%), unsaponifiable matter (0.34%) and glycerol.—A. MACHADO. *Rev. Soc. Brazil. Quim.*, 1938, 7, 73–81; through *J. Soc. Chem. Ind.*, 57 (1938), 1187. (E. G. V.)

Ouricury Palm-Kernel Oil. Fruits of *Syagrus* (*Cocos*) *coronata* from Florida consisted of fibrous pulp (47.5%, containing 3% of red oil) and the nut (shell 76.2, kernel 23.8%). Kernels from Brazil contained 2.4% of water and 69.7% of oil, which deposited only a small amount of stearin at 18° and had a density at 25° of 0.9221, refractive index at 25° 1:4543, acid value 11.2 saponification value 256.9, iodine value (Hanus) 14.69, thiocyanogen value 12.78, Reichert-Meissl value 5.93, Polenske value 18.38 and unsaponifiable matter 0.27%. The fatty acids consisted (as % on oil) of hexoic 1.66, octoic 9.1, decoic 7.64, lauric 42.7, myristic 8.43, palmitic 7.15, stearic 2.15, arachidic 0.096, oleic 12.18 and linoleic acid 2.04. Notes on the technic employed for the ethyl ester fractionation of the acids, and on the interpretation of the data therefrom, are given. Apparent indications of the presence of lower homologues of oleic acid derived solely from consideration of the iodine value and saponification value of ester fractions should be checked by other means as the presence of low molecular decomposition products may invalidate such simple calculations.—R. S. MCKINNEY and G. S. JAMIESON. *Oil and Soap*, 15 (1938), 172–174; through *J. Soc. Chem. Ind.*, 57 (1938), 1185. (E. G. V.)

Ray Liver Oils—Some. The liver oils of the following rays were examined: (1) skate, *Raja kenojei* Müller and Henle, (2) *Raja porosa* Günther, (3) *Raja smirnovi* Soldatov and Parlenko, (4) *Raja karagea* Tanaka and (5) *Raja isotrachys* Günther. The oil contents of the livers ranged from 30 to 61%. All the oils gave a positive test with antimony chloride, but the intensity of the blue color was less than that obtained with cod liver oils. The oil of *Raja kenojei* had an exceptionally high iodine number (240); the others were normal in this respect.—H. TSUJIMOTO. *J. Soc. Chem. Ind. Japan*, 39 (1937), 397B; through *Chimie & Industrie*, 39 (1938), 931. (A. P.-C.)

Ucuuba Fat—Composition of. The fat was examined by fractional distillation of the methyl esters at 1 mm., the molecular weight and saponification value for each 5° fraction being recorded. The fat consists of myristin 70, laurin and other glycerides 5, stearin and higher glycerides 10, olein and unsaturated glycerides 10 and unsaponifiable matter 5%.—F. RAMOS and R. DE CASTRO AYRES DO NASCIMENTO. *Rev. chim. ind.*, 7 (1938), 186–188; through *J. Soc. Chem. Ind.*, 57 (1938), 1184. (E. G. V.)

Unclassified

Acetyl Group. A review of the various methods of introducing the acetyl group into alcohols and phenols to form the corresponding esters of acetic acid.—R. FORNÉT. *Seifensieder-Zeitung*, 65; *Der Parfümeur*, 12 (1938), 687–688. (N. L.)

Alkaline Earth Metal Salts—Water-Soluble. A mixture of tartaric or citric acid with at least a trihydric alcohol containing from 3 to 6 carbon atoms (suitably sorbitol) is heated under reduced pressure (suitably about 15 mm. for about 2 hours at 120° C.) and the water which splits off is removed from the mixture and the heating is continued until, (calculated on the water-free components), at least one carboxylic group per molecule of the acid employed is still present in the free state. There is then added an alkaline-earth metal oxide, hydroxide or carbonate such as calcium carbonate until the reaction mixture is about neutral. Therapeutic products are thus obtained. Numerous examples are given.—HANS SCHMIDT and HEINRICH JUNG, assignors to WINTHROP CHEMICAL CO. U. S. pat. 2,118,985, May 31, 1938. (A. P.-C.)

1-Alkenyl Cyanoacetic Esters. By treating an alkylidene cyanoacetic ester with an alkyl or aralkyl salt in the presence of an alkali metal alkoxide, products are obtained which may be used as intermediates for the production of 1-alkenyl barbituric acids and thiobarbituric acids. Details are given of the preparation of a number of such compounds, and general mention is made of the production of various 1-alkenyl cyanoacetic esters which may be prepared by the process described and which are useful as intermediates in the production of other products.—ARTHUR C. COPE, WALTER H. HARTUNG and FRANK S. CROSSLEY, assignors to SHARP & DOHME, INC. U. S. pat. 2,119,526, June 7, 1938. (A. P.-C.)

Anti-Chlorine Gas Mask—Commercial. The principle of the apparatus rests on the conversion of chlorine to hydrochloric acid by reaction with potassium polysulfide in presence of activated charcoal; a charcoal containing 25% of polysulfide is used for this purpose. The hydrochloric acid formed is absorbed by a caustic alkali (mixture of slaked lime, keiselguhr and soda).—N. A. POLYAKOV. *Hig. Truda*, 15 (1937), No. 3, 41–46; through *Chimie & Industrie*, 40 (1938), 260. (A. P.-C.)

Antimony Trisulfide—Action of, on Hydroxy Acids. Antimony trisulfide reacts on α-hydroxy acids (glycollic, lactic) as well as the oxide and during the entire reaction there is elimination of hydrogen sulfide. The curves obtained in a function of time, of the temperature and of the neutralization are the same as in the case of the oxide; the maximum of fixation always corresponds to an equimolecular mixture of the hydroxy acid and the basic salt. Using the method of the Codex, a good yield of tartar emetic was obtained by the action of the sulfide on potassium bitartrate. The sulfide is no more active on β-hydroxy acids than the oxide.—YVES VOLMAR and ERNEST WEIL. *Compt. rend.*, 206 (1938), 1904. (G. W. H.)

Arylaliphatic Ketones—Catalytic Reduction of, in the Presence of Amines. Synthesis of Ephedrine. A mixture of phenylpropanedione in alcoholic solution with a slight excess of 33% aqueous methylamine was submitted to hydrogenation in the presence of Raney nickel. A rapid absorption of hydrogen was obtained at a constant rate, then a very marked diminution of the rate of hydrogenation when half of the theoretical quantity had been absorbed. The absorption ceased before attaining the theoretical value. The final product consisted principally of *d-l*-ephedrine which was formed in a fairly good yield. The actions of acetophenone, *o*- and *p*-methoxy-propiophenone, benzyl-methyl-ketone and *o*- and *p*-hydroxy-propiophenone are also described.—PAUL COUTURIER. *Compt. rend.*, 207 (1938), 345. (G. W. H.)

Carbon Dioxide—New Absorbent for. The mixture of dipiperidyls obtained by the reduction of technically pure piperidine is a very efficient absorbent of carbon dioxide. An aqueous solution can be used repeatedly by saturating and distilling to 140°, at which temperature the whole of the carbon dioxide is evolved. The absorbent yields 1 pound of carbon dioxide per gallon, will completely strip a gas, and works economically with low concentrations of carbon dioxide and at temperatures up to 80°. The speed of absorption is exceptionally high, being comparable with that of caustic soda solution. Hydrogen sulfide and sulfur dioxide are also absorbed.—R. B. EVANS and D. W. PARKES. *J. Soc. Chem. Ind.*, 57 (1938), 302–306. (E. G. V.)

Chemical Worker—Fundamentals of Safety for. Causes of accidents, safety education and protective equipment are discussed.—G. M. BRIGGS. *Ind. Eng. Chem.*, 30 (1938), 641–645. (E. G. V.)

Chlorinated Solvents. A brief review of manufacture, stabilization, toxicity and applications.—J. D. CONVERSE. *Canad. Chem.*, 22 (1938), 361–364; through *J. Soc. Chem. Ind.*, 57 (1938), 1132. (E. G. V.)

Cinnamic Alcohol and Cinnamic Acid—Esters of. II. A review of the relationship existing between butyl cinnamate, cinnamylbutyrate, amyl cinnamate, cinnanyl-iso-valerianate, cinnamylbenzoate, cinnamylphenylacetate, benzylcinnamate, phenylethylcinnamate, linalyl cinnamate and terpinyl cinnamate.—R. FORNÉT. *Seifensieder-Ztg.*, 64; *Der Parfümeur*, 11 (1937), 887–888. (N. L.)

Coal—Petrol from. Two processes in use, each of which produces a high output of first grade petrol. These processes are: (*a*) The Hydrogenation Process. Coal is first reduced to its simplest constituents—carbon and hydrogen—and then, in the presence of excess hydrogen, at a high temperature and pressure, these are recombined in correct proportions to form petrol. This combination is done by mixing powdered and washed bituminous coal with heavy oil to form a paste, which is then pumped into converters, where the temperature is raised to 460°, and the pressure increased to 250 atmospheres. When the reaction is completed the products are drawn off, and are subjected to fractional distillation to produce the different kinds of oil as required—Dresel, fuel, lubricating oils and synthetic petrol. The process is so adaptable that low and high temperature tar, and creosote oil, can be treated, in addition to brown or black coal. (*b*) The Carbonization Process. In this process coal is treated to produce the maximum quantities of coke, gas and tar. The tar, of which 16 to 20 gallons per ton of coal is produced, is used as the raw material from which the motor spirit is made.—W. P. P. KNELL. *Australasian J. Pharm.*, 19 (1938), 423. (A. C. DeD.)

Coumarin-3-Carboxylic Acid—Quinine Salt of. A compound suitable for therapeutic uses, melting at about 137° to 139° C. and forming lustrous colorless needles, is obtained by reaction of quinine with coumarin-3-carboxylic acid (suitably in acetone as a solvent).—OTTO DALMER and FRITZ VON WERDER, assignors to MERCK & Co. U. S. pat. 2,119,527, June 7, 1938. (A. P.-C.)

Cyclopentanopolyhydrophenanthrene Series—Separation of Hydroxy Compounds of. Substances such as androsterone and dehydroandrosterone are separated from each other by adding a saponin, such as digitonin, to the mixture (suitably in alcohol as a reaction medium) and treating the resulting mixture with a selective solvent such as boiling xylene.—WALTER SCHOELLER, ARTHUR SERINI, MAX GEHRKE, HANS PRIEWE, LOTHAR STRASSBERGER and WILLY LOGEMANN, assignors to SCHERING-KAHLBAUM A. G. U. S. pat. 2,119,515, June 7, 1938. (A. P.-C.)

6-Desoxy-*l*-Ascorbic Acid—Synthesis of. As a starting product served, 2,3-monoacetone-*l*-sorbomethylose which through careful oxidation with permanganate could be converted in a moderate yield into 2,3-monoacetone-*l*-sorbomethylosonic acid which was isolated in a pure crystalline form, m. p. 160–161°. This upon refluxing with alcoholic hydrochloric acid was converted in good yield into 6-desoxy-*l*-ascorbic acid, m. p. 167–168°. This acid proved active in biological tests on guinea pigs.—H. MÜLLER and T. REICHENSTEIN. *Helv. Chim. Acta*, 21 (1938), 273. (G. W. H.)

Dibenzoyl Disulfide—Degradation Studies on. The study was undertaken in order to obtain quantitative conversion to a simple derivative which might simplify the Parr bomb sulfur analysis. It was accomplished by hydrolyses with 40% potassium hydroxide. First a mixture of benzoic and thiobenzoic acids is obtained. Further hydrolytic treatment converts the thiobenzoic acid to benzoic. Three other methods are discussed: conversion to benzanilide, oxidation with potassium permanganate, reaction with triphenyl phosphine.—E. S. COOK and KARL BAMBACH. *J. Am. Pharm. Assoc.*, 27 (1938), 758. (Z. M. C.)

Diethylamides of Some Camphor Derivatives. A description of the preparation of some antinarcotic substances such as diethylamide of camphorsulfonic acid; diethylamide of camphorcarboxylic acid; didiethylamide of amphoric acid and α-diethylamide of camphoric acid.—M. HEROLD and E. JIRAT. *Časopis Československ. Lékárnictva*, 17 (1938), 165–171; through *Chem. Abstr.*, 33 (1939), 811. (F. J. S.)

2,4-Dinitro-5-Naphthylaminophenols. Yellow to orange compounds having insecticidal properties, such as 2,4-dinitro-5-(α- or β-naphthylamino)phenol, are obtained by a process in which 1-chloro-2,4-dinitro-5-arylaminobenzene compound may be hydrolyzed with sodium acetate (suitably with use of acetamide as a reaction solvent). Mention is made of the formation of various similar compounds.—EDGAR C. BRITTON, FRANK B. SMITH, JOHN E. LIVAK and WINFIELD W. SUNDERLAND, assignors to DOW CHEMICAL CO. U. S. pat. 2,120,664, June 14, 1938. (A. P.-C.)

Epimeric Steroid Alcohols with an Hydroxyl in the 3- or 17-Position—Stereochemistry of. A comprehensive survey and discussion.—L. RUZICKA, M. FURTER and M. W. GOLDBERG. *Helv. Chim. Acta*, 21 (1938), 498. (G. W. H.)

Ethyl Chloride. Ethylene and hydrochloric acid are passed into a substantially anhydrous liquid bath of ethyl sulfuric acid containing bismuth or a bismuth compound such as bismuth chloride, serving as a catalyst.—LEONARD C. CHAMBERLAIN and JACK L. WILLIAMS, assignors to DOW CHEMICAL CO. U. S. pat. 2,125,284, Aug. 2, 1938. (A. P.-C.)

Formaldehyde—Manufacture of. A mixture of methanol vapor and an oxygen-containing gas is passed over a catalyst consisting chiefly of a mixture of vanadium and molybdenum oxides in substantially equimolecular proportions and each amounting to at least 40% of the catalyst mixture.—JOHN M. WEISS and CHAS. R. DOWNS, assignors to BAKELITE CORP. U. S. pat. 2,124,388, July 19, 1938. (A. P.-C.)

***d*-Galacturonic Acid—Preparation of, from the Peels of Citrus Hurantium L., Var. Decumana.** The peel of *Citrus Hurantium* (pomelo) is boiled with 60% alcohol, pressed and dried at 100° C. The dry powder (100 Gm.) is refluxed with 2 L. of 3% sulfuric acid for 20 hours, filtered and stirred while 180 Gm. of barium hydroxide in 1.5 L. of water is added; the temperature is kept below 45° C. A suspension of 40 Gm. of barium carbonate in water is added, the solution is heated to 70° to 80° C. for 20 minutes, 15 Gm. of kieselguhr and 5 Gm. of norite are added and

the heating is continued. After filtering, the solution is concentrated to 200 to 300 cc. at 12 to 14 mm. pressure and at a temperature of less than 50° C. After clarifying again with norite, the solution is poured slowly with stirring into 4 volumes of 95% alcohol. The barium *d*-galacturonate is filtered, washed with alcohol and with ether and dried in a desiccator. The yield is 28 to 32 Gm. The barium salt (22 Gm.) is dissolved in 600 cc. of water, 100 cc. of alcohol is added, followed by 360 cc. of fifth-normal sulfuric acid. After decolorizing with norite and kieselguhr, the solution is concentrated in vacuum. The *d*-galacturonic acid is allowed to crystallize in a vacuum desiccator, and recrystallized from a mixture of alcohol and acetone. The yield is 4 Gm. The interest of this method of preparation resides in the possibility of converting the *d*-galacturonic acid into ascorbic acid.—P. P. T. SAH and H. Y. FANG. *J. Chinese Chem. Soc.*, 5 (1937), 107–115; through *Chimie & Industrie*, 39 (1938), 1148. (A. P.-C.)

Glycerin—Some Aminobenzoic Esters of. The following esters of glycerin were prepared by the reduction of the corresponding nitro compounds as previously reported (*Compt. rend.*, 206 (1938), 1305); 1-benzoic-2,3-diorthoaminobenzoic, yellow crystals m. p. 96°; 1-benzoic-2,3-dimetaaminobenzoic, yellow powder m. p. 88°; 1-benzoic-2,3-diparaaminobenzoic, small yellow crystals m. p. 138°; 1,2,3-triorthoaminobenzoic, white needles collecting in tufts m. p. 105°; 1-orthoamino-2,3-diparaaminobenzoic, light brown crystals m. p. 133°; 1-metaaminobenzoic-2,3-diorthoaminobenzoic, white needles collecting in tufts m. p. 115°; 1,2,3-trimetaaminobenzoic, yellowish crystals collecting in tufts m. p. 82°; 1-metaaminobenzoic-2,3-diparaaminobenzoic, yellowish crystals m. p. 171°; 1-paraaminobenzoic-2,3-diorthoaminobenzoic, yellowish crystals collecting in tufts m. p. 109°; 1,2,3-triparaaminobenzoic, small yellow crystals m. p. 168°.—RENE JACQUEMAIN and GEORGETTE DEVILLERS. *Compt. rend.*, 207 (1938), 241. (G. W. H.)

α-Glycerophosphates—A Simple and Almost Quantitative Method of Passing from β- to. Twenty Gm. of sodium-β-glycerophosphate is dissolved in 200 cc. of water, 20 cc. of sulfuric acid are added and the mixture refluxed for 15 minutes. Upon cooling, a slight excess of barium carbonate is added and the mixture allowed to stand for 24 hours with occasional shaking. After filtration, the solution is concentrated to 23–24 Gm. and allowed to crystallize. The crystals are collected and carefully dried. A good yield of almost pure α-glycerophosphate is obtained.—MARIE-CECILE BAILLEY. *Compt. rend.*, 206 (1938), 1902. (G. W. H.)

Iodine. The author pointed out that iodine is one of the rarest of non-metallic elements. It is present in minute traces everywhere, a ton of average rock containing some 300 mg. and a ton of sea water about 17 mg. Only in one place the nitrate deposits of Chile, has the element accumulated as inorganic iodate in uncounted thousands of tons, but again it is there simply as a minor impurity of sodium nitrate deposits. The Chile nitrate factories export nearly 1000 tons of iodine yearly. Three marine organisms are outstanding in being rich in iodine. The iodine content of red and brown seaweeds may be thousands or even millions of times that of the sea water in which they live and may attain one-half per cent of the dry tissue. In the horny sponges and corals, the iodine is present in the skeletal protein as 3:5-di-iodo-tyrosine, and it is a very wide biological jump to vertebrates (including man) to find the same faculty for making this substance (in their thyroid glands). The conversion of di-iodo-tyrosine into thyroxin is indispensable to vertebrates and apparently was an accompaniment of their evolution. It is iodine which determines the metamorphosis of amphibian larvæ (such as tadpoles) and the inadequacy of the element in food is the cause of cretinism, goiter and other disturbances of animal growth due to irregularity in function of the thyroid gland. The opportunity for natural fixation of inorganic iodine into organic form has been extremely slight in all past ages owing to its scanty supply and most living things have managed to evolve without it, except sea animals whose faculty of making di-iodo-tyrosine has been preserved in the thyroid glands of vertebrate successors.—I. MASSON. *Nature*, 227; through *Chemist and Druggist*, 128 (1938), 478. (A. C. DeD.)

Lactation—Process of Preparing a Substance Promoting. The anterior pituitary lobe is extracted at not over 60° C. with a water miscible organic solvent. The gland residue is extracted first with water and then with an aqueous alkaline solution of a p_H value between 8 and 12, and the active substance is precipitated from the alkaline extract by acidification.—CARL L. LAUTENSCHLÄGER and WILLY LUDWIG, assignors to WINTHROP CHEMICAL CO. U. S. pat. 2,125,508, Aug. 2, 1938. (A. P.-C.)

Methionine Studies. I. The Reaction of Methionine and Other Amino Acids with Mercuric Chloride. The evidence obtained indicates the formation of an mercuric chloride

addition compound of the normal Hg^{++} salt of methionine $[(CH_3\text{-}S\text{-}(CH_2)_2\text{-}CHNH_2\text{-}CO_2)_2Hg.(HgCl_2)_4]$ but the forces responsible for the mercuric chloride addition cannot be localized within the methionine molecule. Complete precipitation is favored by neutrality, by the absence of chlorine ion, by removal of the free chlorine ion formed in the reaction with mercuric acetate and by the presence of alcohol. The basic amino acids which form precipitates with mercuric chloride and the acid ones which form precipitates with the Hg ion of mercuric acetate must be absent in the precipitation of the methionine mercury complex. The common neutral amino acids form soluble compounds in a reaction made patent by the liberation of acid but do not interfere by precipitate formation. This effect can be componsated for by an adequate excess of mercuric chloride and by the addition of mercuric acetate and alkali. The possibilities of the formation of mixed compounds of mercury with more than one species of amino acids have not yet been considered.—GERRIT TOENNIES and JOSEPH J. KOLB. *J. Biol. Chem.*, 126 (1938), 367–379; through *Chem. Abstr.*, 33 (1939), 653. (F. J. S.)

Naphthalene Derivatives as Local Anesthetics. A process of producing a naphthalene compound having the structural formula $1\text{-}X\text{:}NCH_2CH_2C_{10}H_6R$, where X is a dialkyl or pentamethylene and R is hydrogen or an ethoxy group, from 1-bromonaphthalene, 1-ethoxy-4-bromonaphthalene or 2-ethoxy-1-bromonaphthalene, involves subjecting such brominated compound to the Grignard reaction, substituting an ethylol radical for the magnesium halide obtained by the Grignard reaction, replacing the hydroxyl of the ethylol radical with a halide, and then replacing the halide with the N=X group. Details are given of the preparation of a number of such derivatives.—ARTHUR J. HILL and MERRITT C. FERNALD, assignors to OSTRO RESEARCH LABORATORIES, INC. U. S. pat. 2,119,077, May 31, 1938. (A. P.-C.)

Nicotine Compositions for Fumigating. A solution suitable for use in greenhouses comprises anhydrous nicotine 75 to 80% and a water-free liquid petroleum hydrocarbon material that boils between 205° and 425° C.—ROBERT B. ARNOLD, assignor to TOBACCO BY-PRODUCTS and CHEMICAL CORP. U. S. pat. 2,120,225, June 14, 1938. (A. P.-C.)

Nitrodiazoamino Compounds—Dimorphous Forms of. Certain diazoamino compounds are known to exist in dimorphous forms which differ sharply as regards crystal form, color and melting point. The present paper records an examination made of some of these compounds in connection with the recent work of the author in the isolation of normal and acid forms of nitrodiazoamino compounds. The existence of the above dimorphous forms has been confirmed with the purified diazoamino compounds, and from a study of their properties it is shown that they are not the normal and acid isomerides.—F. P. DWYER. *J. Soc. Chem. Ind.*, 57 (1938), 357–358. (E. G. V.)

Olefin Hydrogenation. Olefins (amylene, diisobutane and octodecene) were selectively hydrogenated by a nickel catalyst in the presence of aromatics (benzene, toluene and xylene) and also of the paraffin, *n*-heptane. Selective hydrogenation was accomplished by batch process under super-atmospheric pressure and also by continuous process at atmospheric pressure.—V. N. IPATIEFF and B. B. CORSON. *Ind. Eng. Chem.*, 30 (1938), 1039–1040. (E. G. V.)

Oligodynamic Substances. Oligodynamically active substances are produced in water, on surgical instruments and in the form of concentrated solutions and powder, by passing an electric current through a chloride-containing electrolyte of a strength of not more than twentieth-normal between an insoluble cathode and a silver-containing anode; the voltage, the concentration of the electrolyte, the surface area of the electrodes and the distance apart of the latter from one another are so chosen that a comparatively high current density is continuously maintained.—WALTER KRUSE and MAXIMILIAN J. FISCHER, assignors to CURT ANGELMI. U. S. pat. 2,121,875, June 28, 1938. (A. P.-C.)

Organo-Arsenic Compounds. III. Arsenation of Phenol and Some Derivatives of Hydroxyphenylarsonic Acids. In the arsenation of phenol, the authors isolated, among other products which had previously been isolated by other investigators, *o,o'*-dihydroxydiphenylarsonic-acid, which melts at 209° to 210° C. The antimony, bismuth and mercury salts of *o*- and of *p*-hydroxyphenylarsonic acids are prepared by heating the sodium arsonate in glacial acetic acid with the respective metallic chloride.—P. S. YANG and T. Y. WANG. *J. Chinese Chem. Soc.*, 5 (1937), 89–95; through *Chimie & Industrie*, 39 (1938), 1148. (A. P.-C.)

Parasiticidal Composition—Stabilized. *2,123,298*—A composition comprising a thiodiarylamine as the active parasiticidal ingredient is stabilized by the addition of a stable reducing

derivative of a sulfur acid of an oxidation stage lower than that of sulfuric acid. *2,123,929*—A parasiticidal composition containing as active ingredient, a thio-diarylamine, such as thio-diphenylamine, is stabilized against photochemical inactivation by the addition of an ultra-violet opacifier, such as tetramethyl diaminobenzophenone.—EUCLID W. BOUSQUET, assignor to E. I. DU PONT DE NEMOURS & Co. U. S. pats. 2,123,928 and 2,123,929, July 19, 1938. (A. P.-C.)

Phenyl Mercuric Nitrate—Process of Making. An organic phenyl mercuric salt dissolved in a water-miscible organic solvent is treated with a light-insensitive inorganic nitrate the cation of which forms a relatively soluble compound with the acid radical of the phenyl mercuric salt. Water is added to precipitate in a substantially pure state the phenyl mercuric nitrate so formed.—JAS. H. HIBBEN, assignor to CARL MAISEL. U. S. pat. 2,131,008, Sept. 20, 1938. (A. P.-C.)

Resin Phenols—Constitution of, and Their Biogenetic Connections. Mononitro and mononitromonobromo derivatives of eudesmin and pinoresinol dimethyl ether are described. The nitrations were done in glacial acetic acid and acetic acid anhydride and the raw product was recrystallized from dioxane; yield 45%, melting point 169–172°. Nitroeudesmin in 1% chloroform solution, $(\alpha)^{20}_{D}$, 147°; nitropinoresinol, −145°. This is the same as the Kaku and Ri product. The two preparations in equal weight heated in glacial acetic acid gave inactive crystals melting point 160°. Similar chloroform solutions of the bromine derivatives gave (α) 182° for nitroeudesmin and −180° for nitropinoresinol. The active bromine compounds melt 180° and the *dl*-preparation 200°.—H. Erdtman. *Svensk. Kem. Tid*, 50 (1938), (in German), 161–167; through *Chem. Abstr.*, 33 (1939), 165. (F. J. S.)

Retene-Quinone—Synthesis of. With the object of synthesizing 1-oxymethyl-7-isopropyl-phenanthrene, reactions have been developed for the preparation of retene-quinone as follows: γ-(*p*-iso-propyl-phenyl)-butyric acid was cyclized by heat and 80% sulfuric acid to 7-isopropyl-1-keto-1,2,3,4-tetrahydronaphthalene (I). When treated for 20 hours to 190–195° with sulfur or copper sulfide I yields 25–30% of 1-oxy-7-isopropyl-naphthalene (II): m. p. 83°; picrate, m. p. 139–140°. Dimethyl sulfate, converts II into the methylether (III): b. $p._{11}$ 166°; picrate, m. p. 114–115°. Succinic anhydride and III were condensed by aluminum chloride in tetrachlorethane to β-(methoxy-1-isopropyl-7-naphthoxyl-4)-propionic acid (IV) (m. p. 160–161°; yield 90%) which was reduced by Clemensen's method to the corresponding γ-butyric acid (V) (m. p. 137°). The acid chloride of V was obtained with thionyl chloride and cyclized, without being isolated, by distillation under reduced pressure into keto-1-isopropyl-7-methoxy-9-tetrahydro-1,2,3,4-phenanthrene (VI): m. p. 109°. The Grignard reaction introduced a methyl group into VI and simultaneously split out water. The resulting non-crystalline compound was dehydrogenated by selenium at 300–310° to produce methoxy-9-retene: m. p. 108–108.5°; oxidized by chromic oxide to retene-quinone, m. p. 197–198°.—S. MUMATSU, ISHIGURO and SUMI. *J. Pharm. Soc. Jap.*, 56 (1936), 119–121. (R. E. K.)

Rewards and Fairies. A discussion regarding the spirit in which scientific research should be pursued and the faculties which the research worker must cultivate.—SIR JAMES C. IRVINE. *Chemistry and Industry*, 57 (1938), 382–386. (E. G. V.)

Salicylate Ester of Primary Alcohols—New Method of Preparing. It has been shown that heating the sodium salt of the methyl ester of salicylic acid with glycolchlorhydrin in the presence of a primary alcohol results in the exchange of the methyl group of this ester with the group attached to the primary alcohol radical. In this manner a number of salicylic acid esters of sesquiterpene alcohols have been prepared. Santalyl salicylate has been prepared according to the above reactions by dissolving 2.3 Gm. sodium in 20 Gm. alcohol containing 15 Gm. of the sodium salt of methyl salicylate and 8 Gm. glycolchlorhydrin and 22 Gm. santalol. The reaction mixture is first heated at 110° and then at 130°; the resultant product is cooled, treated with water and the product fractionated. Santalyl salicylate boils at 200–235°/6 mm.—E. LE SECH. *Revue des Marques Parfum. et Savonn.*, 15 (1937), 45–46; through *Seifensieder-Ztg.*, 64; *Der Parfümeur*, 11 (1937), 831. (N. L.)

Sweetening Agents with Constitutions Differing from Saccharin and Dulcin. Three products—2,3-diphenyl-2-3-dihydro-1,3,4-naphtho-isotriazine-2^4-sulfonic acid, its 3^4-6-disulfonic acid derivative and 2-hydroxyphenyl-3-phenyl-2,3-dihydro-1,3,4-naphtho-isotriazin-3^4-6-disulfonic acid are discussed. Eight references.—ANON. *Riechstoff Ind. u. Kosmetik*, 13 (1938), 181–182. (H. M. B.)

Theophylline—New Water Soluble Compound of. Following a brief outline of the water soluble organic theophylline compounds so far known, the author describes some work done in combining this drug with piperazine. Theophylline piperazine is not satisfactory for use, however, because solutions are not stable. Theophylline iso-propanol-amine shows low toxicity and possesses primarily the therapeutic action of theophylline.—FREDERICK R. GREENBAUM. *Am. J. Pharm.*, 109 (1937), 550. (R. R. F.)

Wetting and Dispersing Agents. If one of the substituent alkyl groups of the quaternary ammonium compounds is a long chain fatty acid radical, the resulting compound possesses unusual wetting and dispersal properties. These properties are not limited to quaternary ammonium compounds of nitrogen, but extend to heterocyclic compounds such as pyridine.—CHEMITEX. *Mfg. Perfumer*, (1937), 223; through *Am. Perfumer*, 36 (1938), No. 6, 54. (G. W. F.)

BIOCHEMISTRY

Acetone Bodies—Determination of, in Urine. A method is suggested that is more generally applicable than the Engfeldt method. To 10 to 20 cc. of urine and 10 cc. of water add 5 cc. of lead acetate, 1 cc. of 15% sodium hydroxide and 4 cc. of water. After filtering, quantitatively add 5 cc. of lead acetate and 1 cc. of sodium hydroxide solution. Filter and distil 25 cc. of the filtrate with 1 cc. of 10% acetic acid and 20 cc. of distilled water; distil the acetone into a separate container with hypoiodite (20 cc. of hundredth-normal iodine solution, 10 cc. of 15% sodium hydroxide and 10 cc. of distilled water). The moment boiling begins, introduce drop by drop into the distilling flask, 1 cc. of concentrated sulfuric acid and 5 cc. of 2% potassium dichromate and every 5 minutes add 5 cc. of dichromate. After 20 minutes add 5 cc. of concentrated hydrochloric acid to the distillate and after 5 minutes titrate the iodine liberated with hundredth-normal sodium thiosulfate in the presence of starch (1 cc. of iodine = 0.096 mg. of acetone).—I. TROTSKI and R. MENDELSOHN. *Oukr. Biokhim. J.*, 9 (1936), 157–163; through *Chimie & Industrie*, 39 (1938), 865. (A. P.-C.)

Acylase Activity. V. The Splitting of Furfuracryluric Acid. The pig kidney shows acylase activity, splitting furfuracryluric and pyromucuric acid even at low temperature. It is different from the histozyme splitting hippuric acid.—T. MORI. *J. Biochem.* (Japan), 28 (1938), 199–204; through *Chem. Abstr.*, 33 (1939), 657. (F. J. S.)

Alcohol in Biological Materials—Modification of the Nicloux Method for the Determination of Small Amounts of. In the Nicloux method for the determination of alcohol, before redistilling, the first distillate should be treated with mercuric oxide and calcium chloride to destroy fatty acids and aldehydes which have a reducing action. This does not destroy any alcohol.—A. AGGAZZOTTI and A. NIEDERHAUSERN. *Diagn. Tecnica Labor.*, 8 (1937), 331–352; through *Chimie & Industrie*, 39 (1938), 867. (A. P.-C.)

Alcoholic Fermentation—Influence of Some Charcoals on. Charcoals in a concentration of 1% modify the consumption of sugar as well as the quantity of alcohol formed. This influence depends upon the quantity of yeast originally used. The activated charcoals have a more intense action than the non-activated. In general the quantity of alcohol formed does not correspond to the sugar consumed. Only acetylene-black increased the production of alcohol parallel to the consumption of sugar.—YVONNE JEROME-LEVY. *Compt. rend.*, 207 (1938), 191. (G. W. H.)

Alkaline Reserve of Whole Blood—Titrimetric Determination of. The method consists in displacing carbon dioxide from the blood by means of a strong acid and collecting it in a standard alkali solution. The determination is carried out on 2 cc. of blood or oxalated plasma in equilibrium with alveolar air or, more simply, with carbogen which reproduces artificially the required pressure of 40 mm. of carbon dioxide. The carbon dioxide is liberated by slowly pouring on the sample of blood 10 cc. of 1:1 sulfuric acid. The carbon dioxide is absorbed in 10 cc. of fiftieth-normal sodium hydroxide. When the operation is complete the excess of alkali is titrated with fiftieth-normal hydrochloric acid in presence of phenolsulfone phthalein as indicator. The alkali consumed by carbon dioxide generally varies from 0.5 to 0.7 cc. in normal bloods; 1 cc. of fiftieth-normal acid indicates the presence of 1.86 cc. of carbon dioxide (under standard conditions). The average alkaline reserve varies from 40 to 60 cc. of carbon dioxide per 100 cc. of plasma or of blood.—W. L. DULIÈRE. *Compt. rend. soc. biol.*, 126 (1937), 258–261; through *Chimie & Industrie*, 39 (1938), 1079. (A. P.-C.)

Amino Acids—Solubility of Different, in Acetic and Butyric Acids. $PrCO_2H$ fraction: arginine, histidine, lysine, proline, also part of phenylalanine, valine, tryptophan and leucine; acetic acid fraction: glycine, alanine, hydroxyproline, phenylalanine, valine, leucine, methionine, tryptophan, serine, diiodotyrosine, asparagine and glutamine. The precipitate in acetic acid consists of: aspartic acid, glutamic acid, cystine, tyrosine, thyroxine and serine (if much of this amino acid is present).—ST. J. PRZYLECKI and K. KASPRZYK-CZAYKOWSKA. *Biochem. Z.*, 298 (1938), 328–329; through *Chem. Abstr.*, 33 (1939), 189. (F. J. S.)

Amylase—Determination of, in Urine. A modification of the method of Willstatter, *et al.* (*C. A.*, 17, 2718) was used. Small amounts of amylase are continuously excreted in human urine. Fasting adults excrete 0.14–0.24 units per hour. A temporary increase occurs after meals. The total normal for men is 4.6–6.2 units in 24 hours and for women 3.2–4.7 units.—I. VINTILESCO, C. N. IONESCO and V. MANDROI. *Bull. soc. chim. biol.*, 20 (1938), 953–965; through *Chem. Abstr.*, 33 (1939), 192. (F. J. S.)

Aneurin (Vitamin B_1)—Determination of, in Urine by the Thiochrome Reaction. Vitamin B_1 was determined in urine by measuring the intensity of blue-fluorescent light from thiochrome by means of the Cohen fluorometer. Urine was diluted with water to 3 to 10 times its volume (according as it was day or night urine), hydrochloric acid was added to a p_H of 3.0 (slight blueing in presence of Congo Red). To each 30 cc. of urine 100 mg. of Franconite KL was added and the mixture stirred for 3 minutes. Franconite was removed by centrifuging and washing with acidulated water and 96% alcohol; the washed adsorbate was dried at 100° C. Dried adsorbate (100-mg. portions) was weighed into 60 cc. centrifuge tubes to which was added 2 cc. methanol; the mixture was stirred with a stream of pure nitrogen while 1 cc. of 30% sodium hydrogen was added and during the addition of a certain amount of 1% potassium ferricyanide at 30-second intervals. The thiochrome formed was extracted with 13 cc. of isobutyl alcohol while being stirred in a stream of nitrogen and estimated by means of the Cohen fluorometer. The total addition of 0.8 cc. of ferricyanide solution gave the maximum fluorescence. Difficulty was experienced with "greenish fluorescing" substances. This was overcome by carrying out a determination in the prescribed manner on each sample of urine but without adding potassium-ferricyanide. This galvanometer reading was deducted. Difficulties were also encountered with other interfering substances in urine which seemed to inhibit the formation of thiochrome. The values of thiochrome decreased rapidly after passing from a normal diet to a diet free from vitamin B_1 and increased when the latter diet was replaced by a diet rich in vitamin B_1.—H. G. K. WESTENBRINK and J. GOUDSMIT. *Rec. Trav. Chim. Pays-Bas*, 56 (1937), 803–810; through *Chimie & Industrie*, 39 (1938), 1078. (A. P.-C.)

Arakawa's Reaction and Cell Content of Human Milk. The peroxidase-positive cell content of milk runs almost parallel to the intensity of Arakawa's reaction. In the opinion of the author human milk positive to Arakawa-positive milk is a milk richer in cells. The inhibiting influence of milk fat upon Arakawa's reaction is generally negligible in most cases. An index is devised to show the intensity of Arakawa's reaction numerically and simply instead of by the use of signs.—T. SUZUKI. *Tohoku J. Exp. Med.*, 33 (1938), 18. (A. C. DeD.)

Arakawa's Reaction of Lactating Mothers and Calcium Content of Their Urine. Calcium content of the urine is lower in lactating mothers than in healthy female adults, and is much lower in lactating mothers with negative Arakawa's reaction than those with positive Arakawa's reaction.—S. TAKAI. *Tohoku J. Expt. Med.*, 33 (1938), 52. (A. C. DeD.)

Ascorbic Acid and Dehydroascorbic Acid—Method for the Determination of Small Quantities of, in Turbid and Colored Solutions in the Presence of Other Reducing Substances. The indophenol method for the determination of small amounts of ascorbic and dehydroascorbic acids has been adepted for use with the photoelectric colorimeter so that it can be used with turbid and colored extracts and 6–20γ can be determined with very good precision. The method is applicable to a wide variety of plant and animal tissues and determinations in beets and highly colored berry juices are included. The procedure for urine is most useful in comparing the excretion value before and after the administration of ascorbic acid since it is difficult to eliminate the effects of all the other reducing substances which occur in urine. No evidence was found that HPO_3 extractions are incomplete.—O. A. BESSEY. *J. Biol. Chem.*, 126 (1938), 771–784; through *Chem. Abstr.*, 33 (1939), 1005. (F. J. S.)

Ascorbic Acid—Determination of, in Tissues by the Dichlorophenolindophenol Method ("Kinetic" Colorimetric Method). The method involves the use of the author's electrophotometer (*Bull. soc. chim. biol.*, 19 (1937), 113–118) for following the color change. A graphic method of correcting the results for other reducing substances present is described.—P. MEUNIER. *Bull. soc. chim. biol.*, 19 (1937), 877–892; through *Chimie & Industrie*, 39 (1938), 1079. (A. P.-C.)

Ascorbic Acid—Determination of, in Urine with the Photoelectric Colorimeter. In the method described for the determination of ascorbic acid in urine and other biological fluids titration is replaced by an objective photoelectric measurement of the amount of dye decolorized when a measured quantity of urine reacts with an excess of dye. The method does not require standardization of the dye solution, eliminates errors due to interfering colored substances and allows the measurement to be completed within five seconds after addition of the dye. Errors due to non-ascorbic acid reducing substances are greatly reduced and a simple extrapolation procedure makes it possible to reduce this error still further. Titration values obtained by the older method are often from two to more than ten times higher than by the new method although the titrimetric method is quite accurate when the ascorbic acid content is very high. With the new method 24-hour ascorbic acid excretions of less than 5 mg. are often found in normal healthy individuals on adequate well-balanced diets. A study of the shape of the reaction velocity curve obtained from any solution affords a sensitive qualitative test of the ratio of interfering substances to true ascorbic acid and may therefore be employed as a test of the efficiency of any method suggested for the removal of interfering substances. It is recommended that this test be applied to all solutions, even those such as plasma filtrates in which, as a rule, the interfering substances are relatively unimportant. Preliminary precipitation with solid barium acetate is both safe and desirable although it removes only a fraction of the interfering material in urine. Mercuric acetate purification is of no value.—K. A. EVELYN, H. T. MALLOY and C. ROSEN. *J. Biol. Chem.*, 126 (1938), 645–654; through *Chem. Abstr.*, 33 (1939), 1004. (F. J. S.)

B-Avitaminosis and Reticulocytes—Relationship between. The author observed that rabbits show in a state of hunger, a decrease of reticulocyte count and that the disappearance of the younger forms of reticulocyte shift to the left was observed but in a more advanced stage of B-avitaminosis, a decrease of reticulocytes. The increase of reticulocyte count and the reticulocyte shift to the left due to B-avitaminosis are recovered by an administration of Oryzanin Fortior. Apparently healthy rabbits can already be in a state of B-avitaminosis, which is shown by the fact that in them the reticulocyte count is high, and can be lowered by the administration of vitamin B.—SHINGO SHIRAISHI. *Tohoku J. Exp. Med.*, 3 (1938), 31. (A. C. DeD.)

Bile Acids—Applicability of the Sulfuric Acid Fluorescence Reaction of, to Their Determination in Blood, Stools and Urine. Because of the presence of other substances producing fluorescence in concentrated sulfuric acid, it is necessary, in the determination of cholic, taurocholic and glycocholic acids, to measure the band of the fluorescence spectrum at 3850 Angstrom units. Satisfactory results are then obtained if interfering substances (cholesterol, oleic acid) have been removed. Extract 1 Gm. of acidified feces twice with boiling 96% alcohol; evaporate the solution and extract the residue with alcohol, saponify with 5 cc. of 15% potassium hydroxide, evaporate to dryness, suspend in water and remove cholesterol with ether. Carefully remove the ether from the aqueous layer and acidify the latter; then make alkaline with ammonia, precipitate the fatty acids with 5 to 6 cc. of 20% barium chloride; centrifuge the solution, acidify and extract the bile acids with ether (5 times); evaporate the ether and dissolve the residue in 10 cc. of sulfuric acid. Measure the fluorescence after standing for 24 hours.—M. JENKE and F. BANDOW. *Hoppe-Seyler's Z. Physiol. Chem.*, 249 (1937), 16–23; through *Chimie & Industrie*, 39 (1938), 1079. (A. P.-C.)

Biological Chemistry—New Problems in. A comprehensive summary including discussions of steroids, carotenoid coloring substances, the porphyrin system, the effect and nature of inheritance factors and problems of pathology. Fifteen references are given.—A. BUTENANDT. *Angew. Chem.*, 51 (1938), 617–622; through *Chem. Abstr.*, 33 (1939), 185. (F. J. S.)

Blood Alcohol—Determination of, by the Widmark-Rappaport Method and Its Possible Forensic Applications. All glassware used for this determination must be carefully cleaned with sulfo-chromic mixture. In each of two Erlenmeyer flasks place 1 cc. of chromosulfuric reagent (0.25 Gm. of potassium dichromate, 1 cc. of distilled water and concentrated sulfuric acid to 100

cc.); to one of them add 0.1 cc. of the blood sample, and place in a thermostat at 56° to 59° C. for 3 hours; cool, dilute cautiously with 20 cc. of distilled water, add 0.5 cc. of 5% potassium iodide solution and titrate the liberated iodine with hundredth-normal sodium thiosulfate solution. The difference in the number of cc. required for the sample and for the blank, multiplied by 113, gives the mg. of alcohol per 100 cc. of blood. The method permitted of establishing the constancy of the neoformation of volatile reducing substances during cadaveric putrefaction over a period of 30 days, and can thus be used to ascertain the time of death.—F. DOMENICI. *Diagn. Tecnica Labor.*, 8 (1937), 161–167; through *Chimie & Industrie*, 39 (1938), 866–867. (A. P.-C.)

'Bluefin" Tuna Liver Oil—Antirachitic Vitamin of. Like the antirachitic vitamin of ordinary tuna liver oil and of halibut liver oil, the antirachitic vitamin of "bluefin" tuna liver oil is identical with vitamin D_3. The vitamin was isolated in the form of the 3,5-dinitrobenzoyl derivative.—H. BROCKMANN and A. BUSSE. *Hoppe-Seyler's Z. Physiol Chem.*, 249 (1937), 176–180; through *Chimie & Industrie*, 39 (1938), 939. (A. P.-C.)

Boric Acid—Determination of, in Food Products. The methods of Jorgenson and of Beythien-Hemple give inaccurate results with meat products containing phosphates. Heberbrand's colorimetric method is satisfactory in the presence of phosphates.—B. I. GUTERMAN. *Proc. Inst. Sci. Res. Food Ind. Lenigrad*, 2 (1935), 72–84; through *J. Soc. Chem. Ind.*, 57 (1938), 1225. (E. G. V.)

Calcium—Determination of, in Rat Urine. Calcium was determined with satisfactory accuracy in small amounts of deproteinized rat urine by a modification of the method of Halverson and Bergeim (*C. A.*, 12, 488). Incineration of the urine was not essential. Uric acid was not precipitated together with the calcium oxalate and was not adsorbed by the precipitate. Precipitation of calcium oxalate was inhibited by sulfate ion in concentrations greater than 1%. Methods of ashing involving the addition of sulfuric acid are not applicable to the microdetermination of calcium in urine.—R. TRUSZKOWSKI, J. BLAUTH-OPIENSKA, Z. DOBROWOLSKA and J. IWANOWSKA. *Biochem. J.*, 32 (1938), 1293–1297; through *Chem. Abstr.*, 33 (1939), 197. (F. J. S.)

Carboxyhemoglobin—Rapid and Accurate Determination of Minute Amounts of, in Blood. The method consists in comparing photometrically (by means of a Pulfrich photometer and a mercury vapor lamp) the blood solution to be examined with a solution of the same hemoglobin content and saturated with carbon monoxide. From the relative extinction coefficient thus obtained, the carbon monoxide content of the blood is calculated by means of the equation $n = 100 - \frac{100 \times Ex}{s \times K \times E_{100\%}}$ in which n is the carboxyhemoglobin %, s is the thickness of the liquid layer in cm., K is the Gm. of hemoglobin per liter, Ex is the relative coefficient of complete extinction of the blood solution completely saturated with carbon monoxide and $E_{100\%}$ is the relative coefficient of extinction of a solution of 1 Gm. per liter of hemoglobin saturated with carbon monoxide as compared with a solution of hemoglobin of the same concentration saturated with oxygen. Up to 2% of carboxyhemoglobin can be determined on 1 cc. of blood with an accuracy of 0.5% in 8 minutes.—J. MAY. *Arch. Gewerbepath.*, 8 (1937), 21–25; through *Chimie & Industrie*, 39 (1938), 867–868. (A. P.-C.)

Chlorine in Blood and Milk of Lactating Mothers with Different Arakawa's Reaction. Chlorine content in the blood of mothers with negative Arakawa's reaction is slightly richer than in that of mothers with positive Arakawa's reaction. The quotient: blood to milk chlorine becomes smaller as the intensity of Arakawa's reaction decreases.—M. ISHII. *Tohoku J. Exp. Med.*, 33 (1938), 71. (A. C. DeD.)

Chlorophyll, Carotene and Xanthophyll—Isolation of, by Improved Methods. Various improvements have been made in the method of Willstatter and Stoll adaptable to large-scale separation and isolation of chlorophyll, xanthophyll and carotene. These pigments serve as a means of coloring foods and oils. The main source of material in the work was stinging nettle leaves.—F. M. SCHERTZ. *Ind. Eng. Chem.*, 30 (1938), 1073–1075. (E. G. V.)

Cholesterol and Cholesterol Esters—Application of the Schoenheimer-Sperry Method to the Determination of, in Tissues. The method of Schoenheimer and Sperry for the determination of cholesterol and its esters in blood (*C. A.*, 28, 6752) has been adapted for the determination in tissues. The new microcolorimetric procedure checks with the macrogravimetric method. The

colorimetry is carried out with the use of a filter because digitonin by this method produces a slight color which is avoided by reading between 610 and 630 mμ, the maximum absorption for digitonin. The water content for complete precipitation need not be 20% as suggested in the original method. Complete precipitation was obtained with variation of the water content from 6 to 20%.—S. STURGES and A. KNUDSON. *J. Biol. Chem.*, 126 (1938), 543–550; through *Chem. Abstr.*, 33 (1939), 1003. (F. J. S.)

Cholesterol—Determination of, in Blood. Advantages of substituting trichloroethylene for chloroform in the Liebermann and Salkowsky reactions are pointed out. It can also be used in place of chloroform in the colorimetric determination of cholesterol by Grigout's method.—M. PAGET and G. PIERRET. *Compt. rend. soc. biol.*, 125 (1937), 654–657; through *Chimie & Industrie*, 39 (1938), 865–868. (A. P.-C.)

Copper Determination in Biological Material. Digest 5–10 cc. blood with 5–10 cc. of a 1:1 mixture sulfuric acid-nitric acid in a Kjeldahl flask, using more nitric acid as needed to get a colorless solution. Evaporate the sulfuric acid in a quartz dish, add 1–2 cc. saturated ammonium nitrate and heat at 400° until a white ash remains. Dissolve in 1 cc. nitric acid, evaporate to dryness on the sand bath, again dissolve in hot 20% hydrochloric acid and centrifuge off undissolved matter. Evaporate to 5 cc., transfer to a 50-cc. glass-stoppered cylinder, and dilute with water to 15 cc. Add 5 cc. fresh saturated $Na_4P_2O_7$, make slightly alkaline to litmus and heat at 80° for 15 minutes. Cool, add 0.5 cc. 1% carbamate solution and extract the copper complex with 5 cc. amyl alcohol. The colored amyl alcohol solution is matched against known amounts of copper (0.005–0.020 mg.). The method was applied to copper determinations in various biological materials.—C. D. STEUSSIJ. *Biochem. Z.*, 296 (1938), 355–358; through *Chem. Abstr.*, 33 (1939), 196. (F. J. S.)

Copper—Quantitative Study of, by Means of Spectrographic Analysis, in Nutrition. Thirty-five copper-balance studies were made with three preschool boys. The daily urinary copper excretion was fairly constant for a given child, averaging 4% of the ingested copper. From 15 to 58% of the ingested copper was excreted by way of the alimentary tract. The lowest copper retentions occurred with the lowest copper intakes, while the highest retention, 0.058 mg., was obtained with an ingestion which was close to the maximum level of copper consumed, *i. e.*, 0.084 mg. per Kg. of body weight. Conclusion: between 0.053 and 0.085 mg. of copper per Kg. of weight is required for boys between 3 and 6 years of age.—F. I. SCOULAR. *J. Nutrition*, 16 (1938), 437–450; through *Chem. Abstr.*, 33 (1939), 1015. (F. J. S.)

Defection—Some New Methods of. Blood or serum can be defecated by means of aluminum hydroxide or tungstate, thorium hydroxide, zirconium hydroxide, calcium fluoride, calcium phosphate or silicic acid. Determinations of the non-protein nitrogen in comparison with a sample which had been subjected to phosphomolybdic acid precipitation showed that the varying results were caused by the individual precipitatibility of the different non-proteinic nitrogen compounds.—F. RAPPAPORT and J. REIFER. *Mikrochim. Acta*, 1 (1937), 220–225; through *Chimie & Industrie*, 39 (1938), 866. (A. P.-C.)

Dicarboxylic Acids—Rôle of, in Metabolism. A lecture.—P. E. VERKADE. *Chemistry and Industry*, 57 (1938), 704–711. (E. G. V.)

Digestive Juices—Dried Natural. Data are presented on the properties of digestive juice before and after drying. The juices have been dried at 0° C. in an especially constructed vacuum desiccator to prevent auto-digestion during the process of desiccation.—W. N. BOLDYREFF, W. B. LEWIS and C. E. STEWART. *Tohoku J. Exp. Med.*, 33 (1938), 224. (A. C. DeD.)

Erythrocytes and Normoblasts—Peroxidase-Positive. Peroxidase-positive red cells of human blood may be shown on blood films by use of the Tohoku Pediatric Method, a modification of Sato-Sekiya's original copper peroxidase reaction, though they can also be shown by the original method. Normoblasts and young non-nucleated red cells of human blood can be peroxidase-positive in the copper peroxidase reaction. A method is described, by which normal human or rabbit's red cells on a blood smear will be made blue peroxidase-positive.—T. SUZUKI. *Tohoku J. Exp. Med.*, 34 (1938), 32. (A. C. DeD.)

Estrogenic Substances—Artificial Preparation of, from Certain Sterols. III. A spectrophotometric study of the structure of "folliculosterone," a female ovarian hormone obtained synthetically from ergosterol, showed that it was 17-keto-5,7,9-ergostatrienol-3, isomeric with the natural hormone. It is considered that the biological activity of the hormone is due not so

much to the phenolic hydroxyl as to the aromatization of a ring in the molecule.—I. REMESOV. *Rec. Trav. Chim. Pays-Bas*, 56 (1937), 1093–1102; through *Chimie & Industrie*, 39 (1938), 1157. (A. P.-C.)

Estrone Sulfate—Isolation of, from the Urine of Pregnant Mares. A method is described for the preparation of concentrates of the water-soluble conjugated estrogens in pregnant mare urine by fractionation of butyl alcohol extracts of the urine. The apparent chromogenic estrogen content (calculated as estrone) of the products obtained may vary from 15 to 65%. A small amount of a water-soluble crystalline substance was isolated from one such concentrate and identified as the potassium salt of estrone sulfate contaminated with traces of equilenin.—B. SCHACTER and G. F. MARRIAN. *J. Biol. Chem.*, 126 (1938), 663–666; through *Chem. Abstr.*, 33 (1939), 1005. (F. J. S.)

Ethyl Alcohol—Determination of, in Blood and Urine with the Photoelectric Colorimeter. The photoelectric colorimetric method described for determining the concentration of ethyl alcohol in blood and urine is based on the direct measurement of the diminution in color of $K_2Cr_2O_7$ resulting from reduction of the ethyl alcohol. The procedure eliminated the preparation of two quantitative solutions, one of them unstable and substitutes objective colorimetry for titration. The ethyl alcohol content of normal blood varies from 0 to 6.5 mg. % and of normal urine from 0 to 2.4 mg. % when determined by this method.—J. G. GIBSON, II, and H. BLOTNER. *J. Biol. Chem.*, 126 (1938), 551–559; *through Chem. Abstr.*, 33 (1939), 1004. (F. J. S.)

Fat Absorption and Metabolism. The conclusions reached by the author as a result of his researches were that fat is absorbed both as fat and as fatty acid. Absorption as fat favors passage by the lacteal-lymphatic route, by which means it short circuits the liver and passes more or less directly to the fat depots. Absorption as fatty acid is by the capillary pathway, and the material passes to the liver *via* the portal vein. The fatty acids are absorbed in aqueous solution owing to the hydrotropic action of the paired bile acids and it is reasonable that they should pass by the same route as other water soluble materials.—A. C. FRAZER. *Analyst*, 63 (1938), 308. (G. L. W.)

Fat Acids in the Lecithin and Glyceride Fractions of Egg Yolk. Palmitic and stearic acids were the only saturated acids identified in lecithin and glyceride fractions of high purity from egg yolk. There may be small amounts of a lower saturated acid in the glyceride fraction. Oleic, linoleic and clupanodonic acids were found in both fractions and in addition 9,10-hexadecenoic acid was isolated from the glyceride. The egg yolk lipides were obtained from eggs produced on a representative egg-laying ration.—R. W. RIEMENSCHNEIDER, N. R. ELLIS and HARRY W. TITUS. *J. Biol. Chem.*, 126 (1938), 255–263; through *Chem. Abstr.*, 33 (1939), 652. (F. J. S.)

Food Products—Production of Coated Frozen Confections or Frozen. A mixture is made of solid anhydrous glucose, a saturated or slightly supersaturated solution of glucose hydrate, and, to initial crystallization, a small proportion of solid glucose hydrate. Gelatin, fats or cocoa may be incorporated.—INTERNAT. PATENTS DEVELOPMENTS CO. Brit. pat. 486,090; through *J. Soc. Chem. Ind.*, 57 (1938), 1097. (E. G. V.)

Glucolysis—Inhibition of, by Glyceraldehyde. Glyceraldehyde inhibits the glycolysis of the isolated lens, just as it inhibits the lactic acid formation from glucose, fructose or glycogen by extracts from muscle or lens. However, the glucolysis of hexose diphosphate or hexose monophosphate by muscle and lens extracts or by hemolized blood is not affected by glyceraldehyde. In lens extracts glyceraldehyde inhibits the esterification of glucose or fructose with inorganic phosphorous, but the esterification of glycogen is not affected in the lens extract or in muscle extract or in yeast maceration juice. In the presence of hexokinase the esterification of glucose by phosphoric acid in muscle or lens extracts is not affected.—H. SULLMANN. *Biochem. Z.*, 296 (1938), 325–347; through *Chem. Abstr.*, 33 (1939), 186. (F. J. S.)

Glucose and Fructose—Analysis of Mixtures of, with Special Reference to Honey. After clarification with alumina cream a dilution of honey is analyzed for glucose by the following method. To 20 cc. of the clarified solution in a 250-cc. flask, add 40 cc. of $N/20$ iodine solution and 25 cc. of $N/10$ sodium hydroxide solution. Stopper and leave for 10 minutes at 15° to 18° C. Acidify with 5 cc. of $N/1$ sulfuric acid and titrate with $N/20$ thiosulfate solution. Deduct this from the volume of $N/20$ thiosulfate solution used in a blank titration. The weight of glucose, (Yg), in mg. is computed by means of the following derived equation—$Yg = 4.484a - 1.58$ where a is the volume of $N/20$ iodine solution absorbed. Fructose is determined as follows:

Oxidize and acidify as for glucose (above) but in a 250-cc. graduated flask. Reduce the liberated iodine by careful titration with 1% sodium sulfite solution, using two drops of a 1% solution of soluble starch as indicator. Neutralize to bromcresol green with $N/1$ sodium hydroxide and make up to 250 cc. with water. Transfer 5 cc. of the solution to a 50 cc. test tube. Add 5 cc. of Shaffer-Somogyi copper reagent (No. 50), stopper, heat in a boiling water bath for 15 minutes and cool. Add 2 cc. of a solution containing 2.5% of potassium iodide and 2.5% of potassium oxalate and 5 cc. of $N/1$ sulfuric acid. Shake well, leave for 5 minutes with occasional shaking and titrate with $N/200$ sodium thiosulfate. Carry out a blank with water. The weight of fructose (Yf) in milligrams is calculated from the derived equation—$Yf = 0.112b + 0.087$ where b is the volume of $N/200$ thiosulfate (difference). The presence of sucrose in amounts not to exceed 3% of the weight of the honey does not interfere.—C. R. MARSHALL and A. G. NORMAN. *Analyst*, 63 (1938), 315. (G. L. W.)

Glucuronic Acid and Conjugated Glucuronides—Method for the Quantitative Estimation of. A simple and accurate method for the quantitative estimation of glucuronic acid in human urine is described which is based on the photoelectric measurement of the color produced with naphthoresorcinol after heating with hydrochloric acid. Normal urines must be diluted from 10 to 20 times to give readings within the range of accuracy of the colorimeter.—G. B. MAUGHAN, K. A. EVELYN and J. S. L. BROWNE. *J. Biol. Chem.*, 126 (1938), 567–572; through *Chem. Abstr.*, 33 (1939), 1004. (F. J. S.)

Glutamic Acid—Microdetermination of. Glutamic acid is converted into succinic acid by treatment with an excess of chloramine T and subsequent acid hydrolysis. The succinic acid is determined manometrically by means of a succinoxidase preparation. The method is highly specific for glutamic acid. With the exception of glutamine no naturally occurring substance has been found to yield succinic acid under the conditions employed. Recoveries of glutamic acid from pure solutions containing 0.1 to 10 mgs. average 95.8%. The method is suitable for intermediary metabolism studies, analysis of body fluids and also for the determination of glutamic acid in protein digests.—P. P. COHEN. *Chemistry and Industry*, 58 (1939), 55. (E. G. V.)

Halohemin (Teichmann) Crystals. A description of the preparation of the chlorine, bromine, iodine and fluorine salts of hemin; the fluorine salts were prepared for the first time.—V. KOCIAN and L. KRACIK. *Priroda*, 28 (1935), 101–104; through *Chem. Abstr.*, 33 (1939), 653. (F. J. S.)

Histidine—Manufacture of Stable Solutions of Ascorbic Acid Salts of. Access of air is prevented during the preparation and the final solution is saturated with oxygen-free gas and stored either in an atmosphere of this gas or in an evacuated container.—F. HOFFMANN-LA ROCHE and Co. A.-G. Brit. pat. 480,503; through *J. Soc. Chem. Ind.*, 57 (1938), 1231. (E. G. V.)

Honeys—Detection of Glucose Syrup in. The freezing point of 10% wt.–volume solutions of honey lie between 0.883 and 0.919, so that any appreciable addition of glucose syrup should be detectable by determining this value. The variation of freezing point in the case of jams is too great for this to be possible. The detection and determination of glucose syrup by simple fermentation with yeast is described.—G. D. ELSDON. *Analyst*, 63 (1938), 422–423; through *J. Soc. Chem. Ind.*, 57 (1938), 1095. (E. G. V.)

Honeysuckle (Lonicera)—Biochemical Studies of Some Species of. The variations of glucidic principles in *Lonicera nigra* in the course of growth (April to October 1935) were studied by the Bourquelot method. In the leaves, reducing sugars and sugars hydrolyzable by invertase vary inversely up to the time of fruit formation; then both groups diminish concurrently. During the yellowing of the leaves, sucrose diminishes, reducing sugar increases. Heterosides varied but little; they accumulate after the fruit is formed. In the barks, invertase reveals the presence of levulosan-like principles whose indexes (mg. of substance per 1° optical rotation) are much higher than that of sucrose; they diminish from spring to the time of ripening of the fruit; this is accompanied before flowering by increase of the reducing sugar. During formation and maturing of the fruit, the reducing sugars in turn disappear from the barks. In autumn, the principles hydrolyzable by invertase accumulate for the winter; the reducing sugars are at lowest level. The heterosides vary but little. Ripening of the fruits runs parallel with intense production of reducing sugars caused partly by decomposition of the levulosan-like principles; the ripe fruit seems to contain mainly sucrose. Variations due to emulsin are very feeble. The formation of young twigs utilizes much reducing sugar and principles hydrolyzable by emulsin. The prod-

ucts due to invertase first accumulate; then they are used solely in the formation of branches.—CH. BEGUIN. *Pharm. Acta Helv.*, 11 (1936), 361–367; through *Chimie & Industrie*, 39 (1938), 720–721. (A. P.-C.)

Hormone Researches—Advances in. A review.—ANON. *Pharm. Post*, 71 (1938), 69–70. (H. M. B.)

Hormones—Manufacture of, from Sterols. Unsaturated polycyclic alcohols (of the cyclopentanopolyhydrophenanthrene series) are oxidized to ketones by heating with an aluminum alkoxide or magnesium chloride and an aldehyde or ketone. For example, cholesterol is converted into cholestenone by heating with aluminum butyrol and acetone in benzene; ergosterol, similarly, gives ergostatrienone, melting point 131–132.5°. The method is applicable to crude concentrates.—NAAML. VENN. ORGANON. Brit. pat. 487,360; *J. Soc. Chem. Ind.*, 57 (1938), 1230 (E. G. V.)

Indican—Detection and the Significance of, in the Urine. A method is described for the determination of the indican in the urine with an experimental error of ±8%. Results in various diseases and with normal subjects showed amounts usually two to three times greater than have been reported by other methods. Intravenous injection of 100 mg. indican was followed by the recovery of practically the entire amount, if allowance is made for daily variations in amounts excreted. This suggests that indican is not destroyed or retained by the organism. The determination of indican may be of value in diagnosis and in following the course of various diseases.—P. SCHLIERBACH. *Deut. Arch. klin. Med.*, 180 (1937), 439–449; through *Chem. Abstr.*, 33 (1939), 194. (F. J. S.)

Insulin Absorption from the Intestine in Normal and in Depancreatized Dogs. Melted pinacol (tetramethyl-glycol) was mixed with a slightly acid, strong insulin solution. The resulting solid mixture was pressed into tablets of 50 units. The absorption of the insulin by the intestine was 35% in normal dogs and 92% in diabetic animals.—RALPH H. MAJOR. *Proc. Soc. Expll. Biol. Med.*, 38 (1938), 721. (A. E. M.)

Iodine—Determination of, in Urine. Make 10 to 25 cc. of the urine alkaline with sodium hydroxide and boil with the addition of powdered potassium permanganate until the color persists for 10 minutes. Destroy the excess of permanganate with sodium perborate in slight excess and add a few small pieces of calcium chloride; boil, filter and wash four times with hot water; evaporate the filtrate to 8 to 10 cc., acidify with acetic acid, boil for 5 minutes after addition of 1 to 2 Gm. of urea, and dilute with water; add sulfuric acid and potassium iodide and titrate with hundredth-normal sodium thiosulfate.—R. BENIGNI. *Biochim. Terapia Sper.*, 24 (1937), 181–186; through *Chimie & Industrie*, 39 (1938), 867. (A. P.-C.)

Iodine in Blood—Microdetermination of, by the Fellenberg-Weil-Sturm Method. A detailed discussion of the causes of error of this method.—B. CACCIAVILLANI. *Biochem. Terapia Sper.*, 24 (1937), 196–201; through *Chimie & Industrie*, 39 (1938), 867. (A. P.-C.)

Iron—Availability of, in Various Foods. A greater hemoglobin gain was obtained with canned leaves plus the cooking liquid of turnip greens and collards than where the dried forms of these leaves were used. The iron of the canned turnip green leaves was less available than that of dried greens. The foods studied fall into the following descending order in respect to the availability of their iron for the regeneration of hemoglobin: blackeyed peas and spinach, turnip greens and kale, collards and mustard, head lettuce and finally tender green and leaf lettuce. In these foods the ionizable iron and the iron available for hemoglobin synthesis were not identical. The gain in hemoglobin expressed in Gm. per 100 cc. in anemic rats fed 0.3 mg. of ionizable iron ranged from 4.0 for leaf lettuce to 7.8 for blackeyed peas. These dried vegetables contained 55–95% ionizable iron. The high value of 70% ionizable iron was obtained for spinach.—L. ASCHAM, M. SPEIRS and D. MADDOX. *J. Nutrition*, 16 (1938), 425–436; through *Chem. Abstr.*, 33 (1939), 1015. (F. J. S.)

Iron—Combination of, in Protein Substances. In addition to unionized, organically bound iron (as in hemoglobin) and inorganic iron, there is also a loose organic iron combination, the so-called "masked iron" in phosphoproteins and nucleoproteins. When phosphoproteins are hydrolyzed the "masked iron" is found in the split products containing the phosphoric acid. In the course of alkaline hydrolysis of vitellin the iron and phosphorous are split off in proportional amounts. Furthermore, in strongly acid solutions only phosphoproteins and nucleoproteins reveal the presence of iron combination. Certain mono and diesters of phosphoric acid form

compounds with ferric salts which resemble the iron combination of phosphoproteins. In strongly acid solutions casein and vitellin, as well as diesters of phosphoric acid, bind maximum amounts of Fe^{+++}, the equivalent ratio of iron:phosphorous being approximately 1:1. The "masked iron" is, therefore, regarded as a poorly dissociable complex of ferric ions with organically bound phosphoric acid.—F. GOTTWALT FISCHER and KURT HULTZSCH. *Biochem. Z.*, 299 (1938), 104–122; through *Chem. Abstr.*, 33 (1939), 657. (F. J. S.)

Iron—Micromethod for the Determination of, in Blood In the micromethod described for the determination of iron in blood acid potassium permanganate is used for the digestion of the small blood sample and the excess is destroyed by the addition of a drop of hydrogen peroxide. The iron is determined by the thiocyanate method after stabilization of the color by addition of $K_2S_2O_8$. Hemoglobin calculated from the iron checks within experimental error with the percentage of hemoglobin as determined by the Newcomer (*Practical Physiol. Chemistry*, Hawk, *et al.*, *C. A.*, 31, 8672) method and while recoveries of added iron are not 100%, they are within experimental error of colorimetry and well within the accuracy demanded of a clinical method—0.1 cc. of blood is used and the error is about 0.6 mg. of iron on the basis of 100 cc. of blood.—R. BREUER and W. E. MILITZER. *J. Biol. Chem.*, 126 (1938), 561–566; through *Chem. Abstr.*, 33 (1939), 1004. (F. J. S.)

Lactic Acid—Determination of, in Small Quantities of Blood An appropriate volume of a 1:20 blood filtrate, deproteinized according to Folin-Wu's procedure and treated with $CuSO_4$-$Ca(OH)_2$ to remove carbohydrate, is transferred to the distilling flask containing 5 cc. of a 3% suspension of MnO_2 in 40% sulfuric acid. The distillation is carried out in a special apparatus for 20 minutes into 3 cc. of 1% sodium bisulfite. If the blood contains β-hydroxybutyric acid this must be separately determined in the blood filtrate by oxidation with potassium dichromate and distillation. The aldehyde bound by the sodium bisulfite is determined by titration with iodine. The difference between the two titrations represents the iodine used up by the lactic acid.—F. LAUERSEN and H. WAHLLÄNDER. *Biochem. Z.*, 298 (1938), 273–292; through *Chem. Abstr.*, 33 (1939), 196. (F. J. S.)

Lactic Casein—Determination of p_H of. Five Gm. of casein are thoroughly ground with 50 cc. of water for not less than 30 minutes. The supernatant liquid is decanted for an electrometric p_H determination. The hydrogen, antimony or quinhydrone electrode can be used, the last named being preferred for rapid working. A saturated mercurous chloride electrode is used as half-cell and is connected with an agar bridge through saturated aqueous potassium chloride to the casein extract. Values ranging from 4.1 to 5.0 were obtained for casein samples from industrial sources. —J. PIEN and M. WEISSMANN. *Lait*, 18 (1938), 455–462; through *J. Soc. Chem. Ind.*, 57 (1938), 1222. (E. G. V.)

Lead Analyses of Hair as an Indication of Exposure to Lead. Administration of lead salts to young rats did not lead to an increased amount of metal in the hair. The metal does not seem to be eliminated through the hair. On the basis of observation on 30 human beings with variable exposure to lead, it is concluded that the degree of exposure may be estimated with reasonable accuracy by analysis of the hair for this metal.—JOSEPH L. MELNICK and GEORGE R. COWGILL. *Proc. Soc. Exptl. Biol. Med.*, 38 (1938), 899. (A. E. M.)

Lipase from the Pancreas of Different Species. The pancreas reaches its maximum development at the time of puberty; also its consistency changes with age, becoming more solid. The adhering fat varies with the species in the following order: pig > beef > sheep. The lipase content of the pancreas is small in young animals but increases up to the time of puberty. The relative lipase activity of pig, beef and sheep pancreas is in a ratio of 17:11:12, comparable with the relative size and consistency of the glands in these animals.—TADEUSZ CHRZASZCZ and MIECZYSLAW JANICKI. *Biochem. Z.*, 296 (1938), 295–305; through *Chem. Abstr.*, 33 (1939), 654. (F. J. S.)

Liver Esterase—Effect of Oxidation and Reduction on the Reversible Action of. I. Hydrolysis by liver esterase is increased by reduction and decreased by oxidation, while its synthetic activity is increased by oxidation and diminished by reduction. The pheron portion of liver esterase exerts a synthesizing action. Although it does not promote hydrolysis, this can be induced by a reduction.—S. KAYASIMA. *J. Biochem.* (Japan), 28 (1938), 175–783; through *Chem. Abstr.*, 33 (1939), 657. (F. J. S.)

Mercury—Determination of Small Amounts of, in Saliva. To a 24-hour amount of saliva 1–3 cc. of sulfuric acid (specific gravity 1.84) is added in a Kjeldahl flask. The mixture is heated until discolored and neutralized with ammonium hydroxide. Potassium iodide is added to change the mercury salt into mercuric iodide. The mercuric iodide is changed into $CuIHgI_2$ by the following reaction: $HgI_2 + 12KI = K_2HgI_4 + 10KI$; $K_2HgI_4 + 10KI + 6CuSO_4 + 3Na_2SO_3 + 3H_2O = CuIHgI_2 + 5CuI + 6K_2SO_4 + 6NaI + 3H_2SO_4$. The color of the final product varies from light yellowish pink to orange, and it is compared with a prepared standard scale.—E. PEREGUD and E. KUZ'MINA. *Lab. Prakt.*, (U. S. S. R.) No. 5 (1937), 36–39; through *Chem. Abstr.*, 33 (1939), 193. (F. J. S.)

Methyl Glyoxal in Urine of Lactating Mothers. The methyl glyoxal-like substance in urine was much more frequently identified in lactating mothers with milk negative to Arakawa's reaction than in Arakawa-positive mothers, even though all mothers were "healthy."—R. ORIMO. *Tohoku J. Exp. Med.*, 33 (1938), 543. (A. C. DeD.)

Molecular Distillation. Examination of Vitamin D. Examination by distillation and rat assay of the fractions of calciferol shows that it has a simple elimination curve. Cod liver oil has a complex curve indicating two chief vitamins, two present in lesser quantities and traces of two more. The curves for spearfish and white sea bass are different from each other and from cod liver vitamin D. The lowest boiling vitamin D is probably devoid of side chains on the C_{17}-atom of the cholane nucleus.—K. C. D. HICKMAN and E. LEB. GRAY. *Ind. Eng. Chem.*, 30 (1938), 796–802. (E. G. V.)

Muscle—Some Aspects of the Biochemistry of. Three lectures, dealing with the anerobic breakdown of carbohydrate in muscle, the rôle of adenosine triphosphate and phosphogen in glycogenolysis, and cozymase.—S. OCHOA. *Chemistry and Industry*, 57 (1938), 720–727; 910–914. (E. G. V.)

Nicotinic Acid—Colorimetric Estimation of, as Applied to Commercial Liver Extracts. The cyanogen bromide method for estimation of nicotinic acid is reviewed, and its application to liver extracts investigated. The adsorption of nicotinic acid and its amide by various charcoals has been demonstrated, and the use of charcoals for decolorization is open to criticism. The nicotinic acid content of commercial liver extract varies within very wide limits. The probable causes are discussed and the importance of clinical workers specifying the brand of liver extract used by them emphasized. Further work on the test and its application is in hand.—G. E. SHAW and C. A. MACDONALD. *Pharm. J.*, 141 (1938), 265. (W. B. B.)

Nicotinic Acid—Failure of, to Prevent Nutritional Cytopenia in the Monkey. Monkeys were given a diet which experience had shown would produce anemia, leukopenia and death. The addition of nicotinic acid at varying dosage did not prevent cytopenia or prevent death. The syndrom in the monkey is not analogous to black-tongue in the dog or pellagra in man. The designation vitamin M is proposed for the factor that prevents cytopenia in the monkey.—PAUL L. DAY, WILLIAM C. LANGSTON and WILLIAM J. DARBY. *Proc. Soc. Exptl. Biol. Med.*, 38 (1938) 860. (A. E. M.)

Nitrogen—Hypobromite Method for the Determination of Residual, in Blood. A simplified, exact bromometric determination method of nitrogen in blood is given in which no ammonium hydroxide distillation is required. The following reagents are used: 30% solution trichloracetic acid, 50% solution sulfuric acid, 8% solution sodium hydroxide, 10% solution sodium acid phosphate, solution of bromine in sodium bromide (100 Gm. Na_2Br + 3 cc. bromine in 1000 cc. water), 5% solution potassium iodide, 0.5*N* solution $Na_2S_2O_3$, 10% solution sulfuric acid, 1% solution starch, 1% aqueous solution of methyl red. The error was found to be 1.5–3% when the sample contained 0.0635–0.1589 mg. nitrogen.—Y. M. RUDNITSKAYA and F. I. GIMMERIKH. *Lab. Prakt.* (U. S. S. R.) No. 2 (1937), 15–16; through *Chem. Abstr.*, 33 (1939), 193. (F. J. S.)

Oxalic Acid—Determination of, in Urine. To 2 cc. of urine add 8 cc. of 3% trichloroacetic acid, mix, and filter or centrifuge; to 5 cc. of the filtrate placed in a special centrifuge tube constructed with a diverticulum add 1 cc. of 5% sodium hydroxide and 1 cc. of 20% calcium chloride; stir, allow to stand 1 hour and centrifuge 30 minutes at 3000 r. p. m.; wash the precipitate twice with 2 cc. of water containing 1 drop of sodium hydroxide solution, centrifuging 15 minutes after each washing; dissolve the precipitate in 2 cc. of water containing just enough acetic acid to effect solution of the precipitate, add 2 to 5 drops of 3% cerium chloride, allow to stand 30 minutes

and centrifuge; wash the precipitate twice with 2-cc. portions of 1% sodium chloride solution and dissolve in 2 cc. of 10% sulfuric acid; add 2.0 cc. of hundredth-normal potassium permanganate and 0.5 cc. of 1% manganese sulfate and allow the solution to stand 3 minutes at room temperature; determine the excess of potassium permanganate iodometrically by adding 3 drops of 10% potassium iodide and titrating the liberated iodine with hundredth-normal sodium thiosulfate. Subtracting the volume of thiosulfate used from 2 and multiplying the difference by 45 gives the mg. of oxalic acid per 100 cc. of urine. If the urine is concentrated, smaller samples should be used. The precision of the method is ±4%.—S. OIKAWA. *Japan. J. Med. Sci. II. Biochem.*, 3 (1937), 211–216; through *Chimie & Industrie*, 39 (1938), 1079. (A. P.-C.)

Oxyhemoglobin, Methemoglobin and Sulfhemoglobin—Microdetermination of, in a Single Sample of Blood. A simple, accurate photoelectric method is described for the determination of oxyhemoglobin, methemoglobin and sulfhemoglobin in a single 0.1-cc. sample of finger blood. The determination of methemoglobin is subject to an error of not more than 0.2 Gm. per 100 cc. but this also represents the smallest amount which can be detected with certainty. As little as 0.1 Gm. of sulfhemoglobin can be detected but the absolute accuracy of the measurement is somewhat less than that of the methemoglobin determination.—K. A. EVELYN and H. T. MALLOY *J. Biol. Chem.*, 126 (1938), 655–662; through *Chem. Abstr.*, 33 (1939), 1005. (F. J. S.)

Ozonized Oxygen—Action of, on the Hemolytic Properties of Serums. When ozonized oxygen is bubbled for only 1 minute through a small quantity of pure, unheated serum, the hemolytic power of the serum toward sheep corpuscle remains unchanged. If a 1:10 dilution of the serum is treated in the same way, the hemolytic power is destroyed completely.—E. PEYRE and H. MORICOURT. *Comp. rend. soc. biol.*, 125 (1937), 642–643; through *Chimie & Industrie*, 39 (1938), 936–937. (A. P.-C.)

Pancreatic Lipase. III. The Activation of the Washed Enzyme by Blood Serum and Other Substances. The activation of washed pancreatic lipase by blood serums and by the dialyzate from boiled enzyme is largely due to their buffering capacities since a similar activation is observed on addition of phosphate buffer or a single amino acid such as phenylalanine or glutamic acid. If the amphoteric character of the amino acid is destroyed, the activating power disappears. The greater part of the activating power of boiled enzyme dialyzate is probably due to the buffering action of phosphates although the activating power is partly destroyed by nitrous acid treatment. The use of the term, coenzyme, to describe activators of this type is not justifiable since there is no evidence to show that they are specific and indispensible.—L. RABINOWITCH and A. M. WYNNE. *J. Biol. Chem.*, 126 (1938), 109–115; through *Chem. Abstr.*, 33 (1939), 652. (F. J. S.)

Pancreatin—Official, Determination of Lipase in. Into a 60-cc. glass-stoppered flask put 0.6 Gm. of glycine, 2 cc. of normal sodium hydroxide, 8 cc. of water at 40° C., then 40 mg. of 1% lactosated pancreatin (cold-triturated); agitate, then add 10 cc. of 1% agar-agar solution (p_H 7, sterilized) and 1.5 cc. of purified tributyrin (freed from the mono- and di-compounds and propionic acid); shake, put the flask at once into a water bath at 40° C., and allow to digest for 2 hours, stirring for 30 seconds at 5-minute intervals during the first half hour, then every 10 minutes to the end. At this moment verify the p_H, which must remain above 8.4 (phenolphthalein) and stop lipolysis by adding 1 cc. of 10% sodium metaphosphate and 5 cc. of normal sulfuric acid; agitate and keep the flask on ice. Extract with ether within 3 hours as the acid medium may induce slight hydrolysis of the unchanged ester; transfer to a 300-cc. separatory funnel, rinse with 2 × 3 cc. of water; add 50 cc. of ether, shake, separate the ether solution and exhaust with 3 × 25 cc. of ether; wash the combined extracts with 2 cc. and then with 1 cc. of water; transfer the ether to a flask, add 50 cc. of absolute alcohol and 10 cc. of water, and titrate to blue with decinormal sodium hydroxide and bromothymol blue. Simultaneously, carry out a blank test in which the aqueous pancreatin solution is previously boiled for 2 minutes. The difference in the two titrations measures the assay value of the lipase. For adoption in the French Codex it is recommended that the assay value should not be below 10 cc. of decinormal sodium hydroxide under the experimental conditions given.—H. PENAU and J. GUILBERT. *J. Pharm. Chim.*, 25 (1937), 5–17; through *Chimie & Industrie*, 39 (1938), 935. (A. P.-C.)

Peptone Poisoning and Suprarenals—Blood Gas Content in. In the present investigations with rabbits, peptone was intravenously injected in doses varying from 0.1–1.1 Gm. % of body weight. The carbon dioxide and oxygen content of the blood varied not so significantly in the

normal animals, but animals deprived bilaterally of the suprarenal glands or of the splanchnic nerves reacted upon peptone with some reduction of the carbon dioxide content. It would be difficult to point to definite changes in respect to the oxygen content. The animal used was poisoned with peptone two weeks to 1 month, or infrequently two to three months, after the last operation.—Y. TANEITI. *Tohoku J. Exp. Med.*, 33 (1938), 489. (A. C. DeD.)

Peptones of Gelatin. I. Effect of Different Enzymes on Peptones (Albumose, Peptone and Tryptone). A comparative study of gelatin, and of albumoses, peptones and tryptones obtained from gelatin, shows a rise in free amino nitrogen. In the peptone it is 1.7, and tryptone three times as large as in gelatin. The precipitation reactions are the same for all. Tryptone could be digested only by intestinal mucosa or by tissue peptidases at p_H 7.5, whereas peptone could be hydrolyzed further by trypsin. Albumose was hydrolyzed by pepsin hydrochloride or by trypsin. The gelatin molecule contains practically no demonstrable arginine complex hydrolyzable by arginase, but this fraction definitely increases in the following order: albumose < peptone < tryptone.—T. MORI. *J. Biochem.* (Japan), 28 (1938), 205–216; through *Chem. Abstr.*, 33 (1939), 657. (F. J. S.)

Phenol-Contaminated Waters and Their Physiological Action. The authors used white rats as experimental animals. Drinking water containing from 100 parts to 5000 parts per million were without effect on growth, reproduction or metabolism. Higher concentrations impaired to some extent these functions. A large amount of phenol is rapidly conjugated and eliminated in the urine as fast as absorbed and considerable seems to be metabolized or lost. Modified methods of analysis which eliminate some of the interfering materials are suggested.—V. G. HELLER and LEE PURSELL. *J. Pharmacol.*, 63 (June, 1938), 107. (H. B. H.)

Pituitary Posterior Lobe Powder—Preparation of. In order that the posterior lobes may be readily available for the preparation of the extract, a stable dry powder has been prepared which overcomes these difficulties. The glands, while still frozen, are stripped of skin and other tissue and the anterior and posterior lobes dissected. The several lobes are dehydrated in several changes of acetone and the residual acetone is removed in a vacuum oven at a temperature not exceeding 50° C. They are then reduced to a No. 20 powder, re-dried for four hours in the vacuum oven and finally placed in a dry sealed container, a sample being withheld for estimation of oxytocic activity and moisture content. The pituitary glands of the ox are generally used, sheep pituitaries are small and difficult to dissect, hog glands are scarce and still smaller in size, and further research is required on whale glands. A table is given which shows the results of processing of many thousands of pounds of glands. It is maintained that a good consignment of glands should give not less than 11.0 Gm. of dry posterior lobe per pound of untrimmed gland, moderately good glands from 7.2 to 10.0 Gm., while with poor glands the yield may be as low as 4.8 Gm. The table given shows the ratio between dry posterior and dry anterior lobe. This is approximately 1 to 5.—H. GARTSIDE, J. PRITCHARD and F. E. RYMILL. *Pharm. J.*, 141 (1938), 267. (W. B. B.)

Porphyrin—Excretion of, in Pellagra. Quantitative determinations of the excretion of porphyrin in a case of alcoholic pellagra are presented. Both quantitatively and qualitatively abnormal excretion of porphyrin featured relapse and disappeared during the induced remission.—KONRAD DOBRINER, W. H. STRAIN and S. A. LOCALIO. *Proc. Soc. Exptl. Biol. Med.*, 38 (1938) 748. (A. E. M.)

Prunes—Vitamin B Content of. On a dry matter basis, prunes contain 807 Sherman units per pound.—N. F. WITT and E. E. POE. *Fruit Prod. J.*, 15 (1936), 274–275; through *J. Soc. Chem. Ind.*, 57 (1938), 1224. (E. G. V.)

Pyuria—Hematology of, in Children. In the cases of acute pyuria, leucocytosis resulting from neutrophilia with a rather slight nuclear shift to the left and extraordinary acceleration of sedimentation rate of red cells were seen. There was no parallelism between blood picture and hemosedimentation rate. When pyuric patients had recovered, the morphological blood change returned to normal in a few days. Hemosedimentation rate, however, remained, showing the value from 14 to 15 mm./hour by Yoshida's micro-sedimentation during this time.—M. SHINDO, Y. KOHUBO and SH. KIMURA. *Tohoku J. Exp. Med.*, 33 (1938), 328. (A. C. DeD.)

Reticulocyte Count—Change of, and of Arakawa's Reaction. Mothers with weakly or negative Arakawa's reaction show a decrease of reticulocyte count and a restoration of reticulocyte shift to the normal on an administration of vitamin B. The abnormality of the reticulocyte pic-

ture in such lactating mothers is due to a state of B-avitaminosis.—S. SHIRAISHI. *Tohoku J. Exp. Med.*, 33 (1938), 60. (A. C. DeD.)

Sex Hormones. Preparation of Δ^5-3-trans,17-Dihydroxy-Etio-Cholenic Acid from Δ^5-trans-Dehydro-Androsterone. Δ^5-trans-Dehydro-androsterone is converted by the action of acetylene into Δ^5-17-ethinyl-3-trans,17-dihydroxy-androstene (I). The 3-acetate of I was brominated in carbon tetrachloride solution and saturated with ozone. The ozonide was split with warm water and the cleavage product debrominated with zinc in glacial acetic acid solution. From the oily mixture of acid products, the 3-acetate of Δ^5-3-trans,17-dihydroxy-etio-cholenic acid could be detected, by treatment with diazomethane, in the form of the methyl ester crystallizing in leaflets, m. p. 163–164°. The oily fraction from the mother liquor, upon alkali saponification, yielded some of the free dihydroxy-cholenic acid (II) m. p. 260–261°. From it, the methyl ester, m. p. 190–191°, was prepared with diazomethane and the diacetate, m. p. 220–220.5°. The methyl ester yielded at mild acetylization (treatment with acetic anhydride and pyridine in the cold) an acetate m. p. 201–202°, crystallizing in needles, which therefore is different from the 3-acetate of the methyl ester of II.—L. RUZICKA and K. HOFMANN. *Helv. Chim. Acta*, 21 (1938), 88. (G. W. H.)

Sex Hormones. Preparation of 17-Ethinyl-Testosterone and Δ^5-17-Vinyl-3-trans,17-Dihydroxy-Androstene. By conversion of Δ^5-17-ethinyl-3-trans,17-dihydroxy-androstene (I) with acetone in the presence of tertiary aluminum butylate according to the procedure of Oppenauer (*R.*, 56 (1937), 141), there results in a good yield, 17-ethinyl-testosterone which melts at 270–272°, and has a $[\alpha]_D = +22.5$ (in dioxane). By partial catalytic hydrogenation of I with nickel at room temperature and in alcoholic solution, Δ^5-17-vinyl-3-trans,17-dihydroxy-androstene, m. p. 183–184° was obtained. From it, the 3-monoacetate, m. p. 160–161° was prepared by treatment with acetic anhydride and pyridine at room temperature.—L. RUZICKA, K. HOFMANN and H. F. MELDAHL. *Helv. Chim. Acta*, 21 (1938), 371. (G. W. H.)

Sorbitol—Determination of, in Chocolates for Diabetics. Werder's method for the determination of sorbitol in wines is adapted to its determination in chocolates. The weight of dibenzylidenesorbitol obtained varies with the amount of benzaldehyde employed. With 0.6–0.8 cc. 0.2087 Gm. of condensation product is obtained from 0.1 Gm. of sorbitol. For the determination, the chocolate is extracted with 95–98° ethyl alcohol, the extract is evaporated, the residue taken up in aqueous sulfuric acid, treated with benzaldehyde, and kept for twelve hours at a lowered temperature. Successful results were not obtained when *o*-chlorobenzaldehyde was substituted for baldezhyende.—C. VALENCIEN and J. DESHUSSES. *Mitt. Lebensm. Hyg.*, 28 (1937), 179–184; through *J. Soc. Chem. Ind.*, 57 (1938), 1096. (E. G. V.)

Starch—New Iodine Method for the Determination of. Five Gm. of the well-mixed sample are weighed directly into a 100 cc. beaker and made into a paste with 5 cc. of 5% alcoholic potash, a flattened glass rod being used for mixing. Fifty cc. more of alcoholic potash are then added and the mixture is heated on a water bath for 15 minutes. The beaker is then allowed to stand for a few minutes and the supernatant liquid is decanted through filter paper in a Büchner funnel without disturbing the residue. This procedure of adding alcoholic potash, heating and decanting, is repeated twice more. The residue in the beaker is now boiled twice with 80% alcohol, and the liquid is again decanted through the same filter, the alcohol being drained as completely as possible the second time. The small amount of residue on the filter is transferred back to the beaker with 0.7% aqueous potash from a wash bottle with a fine jet. About 75 cc. of aqueous potash are added with stirring, and the starch is gelatinized by gentle simmering over a gas burner for half-an-hour. The liquid is transferred while hot to a 200 cc. measuring flask, and the beaker is washed further with small quantities of water, after which the mixture is cooled and diluted to 200 cc. An aliquot part (10 to 20 cc. is usually sufficient) of the filtered solution is neutralized to phenolphthalein with dilute acetic acid in a 100 cc. beaker, 1 to 2 cc. of $N/10$ iodine solution is added (excess should be present), followed by 40 cc. of 95% alcohol, with stirring. After standing for 5 minutes, the liquid is filtered through a tared alundum crucible (medium grade), and the residue is washed with alcohol, dried and weighed.—F. W. EDWARDS, H. R. NANJI and W. R. CHANMUGAM. *Analyst*, 63 (1938), 641. (G. L. W.)

Starch—New Volumetric Iodide Method of Determining. The method is based on the fact that starch iodide is insoluble in $N/5$ potassium acetate solution (also in $N/2$ sulfuric acid), and that the composition of starch iodide varies with the excess of iodine left in solution in contact

with the precipitate, a chart being used to choose the factor. It is essential to have the starch gelatinized and not in mere suspension, and an excess of iodine must be present. It was found that the quantity of starch used in the test has some effect on the factor, and the chart was constructed to cover the range of 0.025 to 0.20 Gm. of starch, the factor for intermediate quantities being obtained by interpolation. If quantities outside this range are required, a new chart covering the region of the quantities required to be determined should be constructed. Details of the method are given for starch in food products, milk products and fish pastes.—W. WHALE. *Analyst*, 63 (1938), 328. (G. L. W.)

Stigmasterol—Production of. Concentrated preparations of stigmasterol are obtained by submitting triglyceride fats, or oils containing them, for example, soya bean oil, to shortpath, high-vacuum (10^{-2}–10^{-6} mm.) distillation and collecting the first 10–15% of the distillate.—E. W. FAWCETT, J. R. MYLES and IMPERIAL CHEM. INDUSTRIES, LTD. Brit. pat. 487,771; through *J. Soc. Chem. Ind.*, 57 (1938), 1101. (E. G. V.)

Sugar—Cerebrospinal Fluid, Simple Colorimetric Procedure for the Determination of the Content of, with the Pulfrich Step-Photometer. Measure 0.5 cc. filtered or centrifuged cerebrospinal fluid into a clean test-tube, dilute to 10 cc. with water and mix. Place 2 cc. samples in two tubes. To one tube add 0.1 cc. 10% alcoholic α-naphthol solution and underlayer with 4 cc. concentrated sulfuric acid, mix and after 2 minutes place in cold water for five minutes. The other sample serves as a blank and should be checked every time the sulfuric acid is changed; otherwise it remains constant at least for a week. The colored solution is examined in the step-photometer with Filter S 57. The extinction coefficient is a linear function of the sugar concentration which can be determined within the range of 1–100 mg. % from the graph. The special advantage of this procedure is the fact that it can be carried out without preliminary protein precipitation as long as the protein content does not exceed 100 mg. %.—P. UJSÁGHY. *Biochem. Z.*, 298 (1938), 141–149; through *Chem. Abstr.*, 33 (1939), 196. (F. J. S.)

Sulfur—Microdetermination of, in Normal Blood Serum. Reflux 0.5 cc. of serum + 5 cc. of nitric acid on a sand bath for 30 minutes; slowly add 2 cc. of 100-volume hydrogen peroxide; after a few minutes distil and collect the volatile sulfur compounds in an absorber containing 10 drops of bromine and 10 drops of 10% sodium hydroxide. When there remain but a few drops of liquid in the flask, place under a slight vacuum to draw the distillate back into the flask. Repeat the distillation and absorption and again draw the distillate back into the flask. Make a final distillation, continuing it until the residue in the flask is dry. After cooling, add 0.5 cc. of 100-volume hydrogen peroxide to the residue in the flask. Remove the last traces of nitrous gases by heating 5 minutes on the sand bath. The residue can be used directly for the microdetermination of sulfates by Charron's benzidine method.—L. REVOL. *Compt. rend. soc. biol.*, 126 (1937), 22–24; through *Chimie & Industrie*, 39 (1938), 1078–1079. (A. P.-C.)

Tyrosine—Determination of, in Plants. Pulverize 1 Gm. of the material and extract with 90% alcohol for 4 hours to remove phenolic amines as hordenine, tyramine and pigments. Extract with ether for 3 hours to remove lipides. Hydrolyze with 20% sodium hydroxide for 20 hours. After neutralization, let stand 48 hours at about 5° C. Remove tryptophan by the addition of mercuric sulfate and centrifuging. Place in a 100-cc. volumetric flask, add sufficient sulfuric acid to give a normal acidity when diluted to 100 cc. Warm 15 minutes on the water bath; cool to room temperature; dilute to 99 cc. and filter to eliminate basic mercuric sulfate. Add 1 cc. of 2% sodium nitrite; the red color is due to the formation of a nitrosophenol, catalyzed by mercury salts. Measure the intensity in an electrophotometer. At 20° C. the maximum intensity is reached in 6 minutes and is maintained for 22 minutes. The method measures free as well as protein tyrosine and has a relative error of ±5%.—Y. RAOUL. *Compt. rend. acad. sci.*, 204 (1937), 197–200; through *Chimie & Industrie*, 39 (1938), 934. (A. P.-C.)

Tyrosine Determinations. Lugg's Method (*C. A.*, 31, 8444[3]) for the determination of tyrosine can be simplified as follows: To bring the p_H of the standard and unknown solutions to the same required value, the 5 cc. test solution brought to 1*N* sulfuric acid can be used directly, since the p_H is about 1. Tyrosine in egg albumin is 3.81 by this procedure, compared with 3.85 by the Folin-Marenzi (*C. A.*, 23, 4492) method. The solutions made in this way may stand twenty-four hours without loss of tyrosine.—C. REITER. *Science*, 88 (1938), 379; through *Chem. Abstr.*, 33 (1939), 191. (F. J. S.)

Urea Content in Human Milk and Arakawa's Reaction. Quite contrary to the result of chlorine or calcium content, the urea content in human milk shows a remarkable individual fluctuation, entirely irrespective of the outcome of Arakawa's reaction.—G. SUGIHARA. *Tohoku J. Exp. Med.*, 33 (1938), 558. (A. C. DeD.)

Uric Acid—New Method for Determination of, in Urine. Instead of the usual $UO_2(C_2H_3O_2)_2.2H_2O$ used for the precipitation of the phosphates, Birbraer proposes to use the more easily obtainable $UO_2(NO_3)_2.6H_2O$. $Na(C_2H_3O_2).3H_2O$ is used as a buffer to overcome the low result. The free nitric acid reacting with $Na(C_2H_3O_2)$ combines releasing acetic acid. The amount of uric acid is determined by precipitating it with ammonium sulfate and titrating with MnO_4^-. The results obtained by using both $UO_2(NO_3).6H_2O$ and $Na(C_2H_3O_2)3H_2O$ are very close to those obtained when $UO_2(C_2H_3O_2).2H_2O$ is used to precipitate the phosphates.—M. L. BIRBRAER. *Lab. Prakt.*, (U. S. S. R.), No. 5 (1937), 39–40; through *Chem. Abstr.*, 33 (1939), 193. (F. J. S.)

Urine Chlorine of Infants Nursed with Human Milk of Different Arakawa's Reactions. The relation between Arakawa's reaction and the chlorine content of the urine of breast-fed infants is investigated. The chlorine content in the urine of breast-fed infants is 38 mg. % in Arakawa-positive cases and 41.5 mg. % or 37.3 mg. % in intermediate or almost completely negative cases. Viewed from the chlorine figures of milk of mothers with different Arakawa's reaction and those in the urine of breast-fed infants nursed with milks of different Arakawa's reaction, it is probable that an abnormal chlorine retention occurs in the body of babies fed with Arakawa-negative milk.—M. ISHII. *Tohoku J. Exp. Med.*, 33 (1938), 567. (A. C. DeD.)

Vitamin A Activity of Animal and Vegetable Products—Factors Affecting. In general, the vitamin A and carotene content of foodstuffs are not affected by boiling in water in open vessels. Detailed results are given.—N. K. DE and B. N. MAJUMDAR. *Indian J. Med. Res.*, 25 (1938), 857–862; through *J. Soc. Chem. Ind.*, 57 (1938), 1095. (E. G. V.)

Vitamin A—Determination of. The oil or tissue is extracted with alcohol. The exact absorption curve of the resulting solution is determined; and the solution is irradiated, with a mercury vapor lamp and a Wood filter, until the absorption at 3250 Angstrom has decreased to a constant value while the absorption at 3650 and 2900 Angstrom remain unaltered. The vitamin A is decomposed by the irradiation and its decomposition products possess at 3250 Angstrom an absorption two-thirds that of the original vitamin. The decrease in this absorption multiplied by 3 is a measure of the vitamin A content of the sample.—A. CHEVALLIER. *Z. Vitaminforsch.*, 7 (1938), 10–16; through *Chimie & Industrie*, 39 (1938), 1156. (A. P.-C.)

Vitamin B_1—Excretion of, in the Urine and Feces. The condition of vitamin B_1 excretion equilibrium is described for white rats. Rats in excretion equilibrium on levels between 15 and 515γ show the following distribution of the ingested vitamin: 25–35% excreted in the urine, 20–30% in the feces and the balance unaccounted for. Animals with a previous history of low vitamin intake show a time lag before reaching excretion equilibrium. If the animals are brought to excretion equilibrium at a level between 50 and 65γ a further increase in feeding level will show no time lag before reaching excretion equilibrium. Subcutaneous injection of 200–500γ per day per rat caused the excretion *via* urine of 75–85% of the vitamin, whereas 10 Kg. dogs showed urinary excretion of only 50% of 2000γ injected.—R. F. LIGHT, A. S. SCHULTZ, L. ATKIN and L. J. CRACAS. *J. Nutrition*, 16 (1938), 333–341; through *Chem. Abstr.*, 33 (1939), 1013. (F. J. S.)

Vitamin B_1 on Arakawa's Reaction and on Milk Sulfate. Vitamin B_1 was administered to ten lactating women and the change of sulfate content in their milk studied. The result is that sulfate content decreased in most cases on administration of the vitamin B_1.—K. YOSHIMO. *Tohoku J. Exp. Med.*, 33 (1938), 576. (A. C. DeD.)

Vitamin C Content—Correlation between, and Complement Titer of Human Blood Plasma. A qualitative relationship exists between vitamin C intake and complement titer in the human plasma, although an adequate explanation of the phenomenon is not clear at present.—FU-T'ANG CHU and BACON F. CHOW. *Proc. Soc. Exptl. Biol. Med.*, 38 (1938), 679. (A. E. M.)

Vitamin E—Simple Method for Concentrating. A simple method is described for concentrating vitamin E eliminating fractional distillation, selective adsorption and other lengthy operations. The procedure is based upon removal of most of the inactive substances from the unsaponifiable fraction of wheat germ oil by their precipitation from methyl alcohol at dry-ice temperature. A single 3 to 7 mg. dose of the concentrate confers fertility on female rats deficient

in vitamin E.—C. G. MACKENZIE, J. B. MACKENZIE and E. V. MCCOLLUM. *U. S. Pub. Health Repts.*, 53 (1938), 1779-1782; through *Chem. Abstr.*, 33 (1939), 206. (F. J. S.)

Vitamin K, the Fat-Soluble Antihemorrhagic Vitamin. The fat-soluble K factor is a distinct vitamin for chickens, geese, ducks and various other fowls. Vitamin K deficiency results in a characteristic bleeding disease which occurs in many organs, particularly subcutaneous or intramuscularly. Changes in the gizzard are also observed. A diet which causes vitamin K deficiency is as follows: 15% of ether-extracted pork liver, 12% of dried yeast, 71% of sucrose and 2% of salt mixture with some cod liver oil. The disease develops in 10 to 30 days. The coagulating period of the blood is greatly increased, from half to several hours, as compared with 2 to 4 minutes in normal chicken blood. The disease can be prevented by a diet which includes pork liver, pork liver fat, cabbage, alfalfa, spinach, tomatoes, etc. Cod liver oil, wheat germ oil, ultraviolet irradiation, carotene, yeast, egg albumin and the antiscorbutic vitamins are ineffective. The concentration of vitamin K, its determination and standardization are discussed. There is probably no connection between the bleeding caused by vitamin K deficiency and hemophilia congenita.—H. DAM. *Angew. Chem.*, 50 (1937), 807–811; through *Chimie & Industrie*, 39 (1938), 940. (A. P.-C.)

Water in Blood—Accelerated Method for the Determination of. Boil (gently at first) 10 cc. of blood with 100 cc. of xylene or toluene saturated with water and in the presence of pumice, until most of the water is distilled off, then increase boiling. Collect the distilled water in a graduated cylinder; its reading multiplied by 10 is the % water in the blood. The accuracy is as good as by the drying method.—I. A. SMORODINTSEV and L. M. REIN. *J. Prikl. Khim.*, 10 (1937), 1140; through *Chimie & Industrie* 39 (1938), 868. (A. P.-C.)

ANALYTICAL

Alkaloidal Determinations—Newer Methods of. A review with thirty-nine references.—K. BRUNNER. *Deut. Apoth. Ztg.*, 53 (1938), 1021–1023; 1035–1037. (H. M. B.)

Alkaloidal Tinctures—Evaluation of. I. The determination according to the methods given for nux vomica in the homeopathic pharmacopœia contains an error in that the chloroform solution of the alkaloids is occluded by the tragacanth used. This error is avoided by using an aliquot portion of the chloroform solution. Another source of error (especially with hydrastis and hyoscyamus) is the use of ether which becomes saturated with diluted ammonia instead of water. The following method is described for the assay of calabar, granatum and lobelia: Evaporate 50 Gm. of the mother tincture in a shallow vessel (6 cm. in diameter) at a low temperature to about 5 cc. Rinse the residue into a flask with 2 × 5 cc. water, add 5 cc. of a saturated solution of sodium bicarbonate as well as 100 cc. of ether and set aside with frequent vigorous shaking for one hour; pour the ether solution in a flask, add 5 cc. water and shake. After settling, pour the ether solution into a small flask, add 10 Gm. anhydrous sodium sulfate and allow to stand for 30 minutes. Use 50 cc. of the dried ether solution (= 16 Gm. of the tincture) for the analysis carried out by the usual methods. Ten references are given.—A. KUHN and G. SCHÄFER. *Deut. Apoth. Ztg.*, 53 (1938), 968–970. (H. M. B.)

Alkaloidal Tinctures—Evaluation of. II. The following methods are described: *Determination of Coniine.*—Slightly acidify 50 Gm. of the mother tincture with diluted hydrochloric acid, evaporate to 10 cc. on a water bath and after cooling make slightly alkaline with ammonia and shake vigorously with 100 cc. of ether for 20 minutes, add 1 Gm. of tragacanth, shake 1 minute, and filter the ether solution through cotton into a small flask and add 10 Gm. of anhydrous sodium sulfate. Shake vigorously for about 30 minutes and then filter through a dry filter. To 70 cc. of the filtrate (= 35 Gm. of the tincture) add 3 cc. of 0.1*N* hydrochloric acid and 5 cc. water, remove the ether by means of a current of air with gentle warming (30° C.) and titrate the excess acid with 0.1*N* sodium hydroxide using methyl red-methylene blue as an indicator. *Determination of Cytisine in Tinctures of Cytisus Laburnum and Baptisia Tinctoria.*—Remove the alcohol from 50 Gm. of the mother tincture by warming on a water bath, make the residue alkaline with sodium hydroxide and allow to stand for 30 minutes with 50 cc. of chloroform with occasional shaking, add 1 Gm. tragacanth and shake briefly. Decant the chloroform solution and dry for $^1/_2$ hour with 5 Gm. of anhydrous sodium sulfate. Decant 40 Gm. of the chloroformic solution through a dry filter into a small flask and evaporate to dryness. Dissolve the residue with 5 cc. alcohol and warm 10 minutes on a water bath with vigorous shaking. After cooling add 3 cc. of 0.1*N* hydro-

chloric acid and 20 cc. water, and titrate the excess acid with 0.1*N* sodium hydroxide using methyl red-methylene blue as an indicator. (1 cc. 0.1*N* hydrochloric acid = 0.0190 Gm. cytisine.)—A. KUHN and G. SCHÄFER. *Deut. Apoth. Ztg.*, 53 (1938), 1006-1008. (H. M. B.)

Amino Acids—Use of the Ninhydrin Reaction in the Determination of. Weigh 0.75 Gm. of ammonium sulfate into an amber glass test-tube, add 1 cc. solution (2–12 mg. amino *N* per liter), 0.04 cc. acetic acid and 0.2 cc. 1% ninhydrin (Bayer). More acid may be required, and the p_H of the mixture should not exceed 2.2. Heat 15 minutes on a water bath and cool rapidly. Extract the colored precipitate with chloroform (10 cc. in all) in a small funnel. Shake the chloroform solution with 0.01*N* sodium carbonate until a beautifully blue-colored solution is obtained, filter and examine in a step photometer. The application of the method to the analysis of α-alanine is fully described.—A. I. VIRTANEN and T. LAINE. *Skand. Arch. Physiol.*, 80 (1938), 392–397; through *Chem. Abstr.*, 33 (1939), 505. (F. J. S.)

Ammonia—Direct Determination of, in Water. Ammonia can be determined by the direct method of Kitts (*Analyst*, 63 (1938), 172) in water containing up to 50 p. p. m. of chlorine as chloride. When the chlorine is in greater concentration ammonia is lost and at a concentration of 180 p. p. m. of chlorine all of the ammonia is lost. Such waters may be determined after dilution.—J. C. HARRAL. *Analyst*, 63 (1938), 597. (G. L. W.)

Antipyretics and Analgesics—Determination of. Two-tenths Gm. of sample is dissolved in 15 cc. of water, treated with 30 cc. of 0.05*N* solution of picric acid, mixed in a volumetric flask and a filtered aliquot is titrated with standard sodium hydroxide (1 cc. of 0.1*N* picric acid = 0.01881 Gm. antipyrine). Four-tenths Gm. of sample with 50 cc. of 0.05*N* picric acid is evaporated to about 10 cc., transferred while hot to a 25-cc. volumetric flask, cooled, filtered and titrated with sodium hydroxide. The difference between the first and second titration represents pyramidone (1 cc. = 0.02312 Gm.). The picric acid method can be used for pyramidone-caffeine-sodium benzoate mixtures, but benzoic and salicylic acids ought to be previously removed.—G. A. VAISMAN and L. G. KOROSTISHEVS'KA. *Farm. Zhur.*, 11, No. 1 (1938), 20–26; through *Chem. Abstr.*, 33 (1939), 316. (F. J. S.)

Arsenic and Antimony—Determination of, in Organic Compounds and Mixtures. The method of Schulek and Villecz for the determination of arsenic in organic compounds (*Arch. Pharm.*, 266 (1928), 411–415) was modified. After destruction of the organic matter, the trivalent arsenic is titrated with potassium bromide and potassium bromate. The same reaction can be used for the determination of antimony. If both are present together, the arsenic is separated by distilling as arsenic trichloride in a stream of hydrochloric acid; the distillate can be titrated bromometrically for arsenic and the residual liquid is titrated for antimony. The method used for destroying organic matter varies according to the nature of the sample.—E. SCHULEK and R. WOLSTADT. *Magyar Gyogyszereszt. Tars. Ert.*, 13 (1937), 314–320; through *Chimie & Industrie*, 39 (1938), 1152. (A. P.-C.)

Arsenic Compounds—Organic, Simultaneous Determination of Chlorine, Nitrogen and Arsenic in. Introduce 0.1 to 0.2 Gm. of sample together with 7 to 8 Gm. of potassium sulfate and 6 to 10 mg. of selenium into a digestion flask connected to an absorption train comprising a tube with 15 cc. of 15% sodium hydroxide +15 cc. of hydrogen peroxide, and a second tube containing 10 cc. of each solution. The absorption tube is connected to a suction pump, 10 cc. of concentrated sulfuric acid is added to the digestion flask, and a slow current of air is passed through the apparatus during the whole digestion. Heating should be very gradual at first and boiling is continued for 5 minutes after digestion is complete. To determine chlorine: boil the solution in the absorbers to remove hydrogen peroxide, add 1 cc. of saturated sodium bisulfite solution, acidify with nitric acid, filter, add excess of silver nitrate, and determine silver chloride in the usual manner; alternatively, chlorine may be titrated volumetrically by the Charpentier method. Determine nitrogen by the Kjeldahl method. Determine arsenic in the residue from the Kjeldahl distillation by adding 10 cc. of saturated sodium bisulfite solution, acidifying with sulfuric acid, heating to boiling, cooling, filtering, neutralizing with sodium bicarbonate and titrating the arsenic with twentieth-normal iodine.—H. N. DAS-CUPTA. *J. Indian Chem. Soc.*, 14 (1937), 358–361; through *Chimie & Industrie*, 39 (1938), 864. (A. P.-C.)

Berberine—Determination of, in Primary Homeopathic Tinctures of Hydrastis Canadensis, Berberis Vulgaris and Berberis Aquifolium. By modifying somewhat the usual methods, hydrastine can be determined more rapidly in primary tincture of hydrastis, and berberine can also

be determined in the same portion of sample. To 10 Gm. of tincture add 2 cc. of water, evaporate, shake the aqueous residue with 2 cc. of ammonia and 60 cc. of ether; wash the ether with 20 cc. of water, filter the ether solution and determine hydrastine as prescribed in the Hungarian Pharmacopœia. To the combined aqueous solutions add 10 cc. of 15% sodium hydroxide solution and extract three times with ether; dry the ether extract, filter, add 15 cc. of a saturated solution of picrolonic acid in ether, after a few hours filter the picrolonate, wash with ether, dry at 110° C., multiply the weight of the precipitate by 0.572 to obtain berberine. Four tinctures of hydrastis contained 0.15 to 0.30% berberine, as much as hydrastine. The same method can be applied to 1 to 2 Gm. of fluidextract of hydrastis. With tinctures of berberis, the alkaline solution is extracted with ether in presence of gum tragacanth.—H. NEUGEBAUER and K. BRUNNER. *Pharm. Ztg.*, 81 (1936), 1416–1417; through *Chimie & Industrie*, 39 (1938), 719. (A. P.-C.)

Calcium—Microdetermination of, in Water. The Clark-Collip modification of the Kramer-Tisdall method may be applied directly to waters of more than 16–20 p. p. m. of calcium.—E. L. BREAZEALE and R. A. GREENE. *J. Lab. Clin. Med.*, 23 (1938), 845–847; through *J. Soc. Chem. Ind.*, 57 (1938), 1241. (E. G. V.)

Carbonizable Substances—B. P. Test for Readily. I. Phenacetin. An impurity was isolated as an orange-yellow liquid, $C_{11}H_{16}NO_2$, of which the merest trace gave an intense orange coloration with sulfuric acid. This test detects the impurity at very great dilution, since no measurable quantity is obtained from 250 Gm. of phenacetin complying with the pharmacopœial limit; its occurrence in commercial grade phenacetin was probably very much less than 0.04%, while from 20 Gm. of the commercial tar examined, only 0.050 Gm. of the impurity was obtained, *i. e.*, 0.20%. It appears that the possibility of phenacetin, B. P., being seriously contaminated with this impurity is remote. It is possible for phenacetin to be contaminated with tarry matter without containing the specific impurity, and such contamination would not be detected by the pharmacopœial test for readily carbonizable impurities, so that the validity of the test is very considerably qualified. It is therefore suggested that the limit test for readily carbonizable substances be replaced by a more comprehensive limit of tarry matter, for which a simple solubility test should suffice, *e. g.*, dissolve 2.5 Gm. in 50 cc. of alcohol (95%) by heating, cool to 15° C.; the solution should be colorless when viewed in a Nessler cylinder.—J. L. PINDER and R. F. R. VENABLES. *Pharm. J.*, 141 (1938), 299. (W. B. B.)

Coffee Extracts. A continuation of the work on coffee infusions reported in a previous paper (*Analyst*, 62 (1937), 62). Total solids, ash, caffeine and sugars are determined. Two methods are suggested for calculating the proportions of coffee and chicory used in making the extract. The results by both methods should be in reasonable agreement if caramel or other non-sugar extractives are not present. Lack of agreement by the two methods is presumptive evidence of the presence of such substances. When caramel is absent the sugar found was principally sucrose. In the presence of added caramel the bulk of the sugar is reducing.—F. W. EDWARDS and H. R. NANJI. *Analyst*, 63 (1938), 323. (G. L. W.)

Colorimetric Standards—Solutions for. Permanent Series for the *o*-Tolidine Method for Chlorine. The study shows: (1) the colorimetric characteristics of the *o*-tolidine yellow, including the desirability of having the final p_H below 2, and (2) the relation between the various permanent standards and their *o*-tolidine yellow equivalents. The Scott standards are considered the best, although the others are visually staisfactory, provided the specification regarding tube length is followed.—G. DRAGT and M. G. MELLON. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 256–258. (E. G. V.)

Copper—Detection of, by Means of Rosin. The test for rosin which consists in adding a little copper acetate solution to the solution of rosin in petroleum ether, whereupon the ethereal solution is colored green or blue-green, can be reversed and used as a test for copper. Add sodium acetate to the solution to be tested for copper and shake with a 1% solution of rosin in petroleum ether or toluene. The test is sensitive to 0.006 mg. of copper; it is specific for copper, but certain metals such as iron, aluminum, manganese, interfere.—L. ROSENTHALER. *Mikrochem.*, 21 (1937), 215–216; through *Chimie & Industrie*, 39 (1938), 858. (A. P.-C.)

Copper—Simple Gravimetric Method of Determining. The neutral solution containing 0.3 to 0.4 Gm. of copper is treated with 8–10 cc. of a 20% solution of potassium sodium tartrate, 30 cc. of a 10% solution of sodium hydroxide and 3 cc. of a 40 volume per cent solution of formaldehyde diluted to 100 cc. If other quantities are used a similar hydroxyl-ion concentration must be

maintained. This mixture is poured into a thoroughly cleaned (by fusing sodium hydroxide in it) and weighed platinum crucible. Precipitation of copper begins in a few minutes, hydrogen is evolved and within two or three hours the solution should be quite colorless, when it is poured out. The copper deposit is washed with water followed by alcohol, dried and weighed.—P. HERSCH. *Analyst*, 63 (1938), 486. (G. L. W.)

β,β'-Dichlorodiethyl Sulfide—Method for Determining. The method will serve to determine the purity of a sample of mustard gas or the concentration of a solution to be used for therapeutic purposes. It is based on precipitation with sodium mercuric iodide and measurement of the volume of the precipitate in a centrifuge tube. The reagent is prepared by dissolving 10 Gm. of sodium iodide in about 70 cc. of water and adding 14 Gm. of mercuric iodide. Place 5 cc. of the reagent and 1 cc. of the mustard gas dissolved in alcohol in a graduated centrifuge tube; the concentration of the mustard gas solution should be 1 to 2% by weight; mix well and allow to stand 5 minutes at 35° to 40° C.; centrifuge for 15 minutes at 5000 to 6000 r. p. m. Continue centrifuging until there is no further increase in the vloume of the precipitate. The value of the graduations on the centrifuge tube should be determined by carrying out an experiment with a known amount of mustard gas. The method serves to determine 1 mg. or more of the gas.—L. BURUIANA. *Z. Analyt. Chem.*, 109 (1937), 107–110; through *Chimie & Industrie*, 39 (1938), 1150. (A. P.-C.)

Digitalis and Digitalis-Like Specialties—Capillary-Luminescence Analysis Studies of. Digitalis and digitalis-like specialties show a variegated capillary-luminescence analytical picture which however is not identical for each one. Similar differences are found between tinctures of digitalis and squill which have been prepared according to the German Pharmacopœia VI. The capillary-luminescence analysis picture is distinct for every preparation. The author observed for a series of preparations, that if one carries out spot tests with these using sodium hydroxide, a yellow-brown color is formed, which color reaction is characteristic for the flavones, especially after the recent studies on citrin (vitamin P). Accordingly, some digitalis and related preparations contain citrin, to which are ascribed the differences in biological activity of the various preparations.—B. BUGYI. *Ber. ungar. pharm. Ges.*, 14 (1938), 377; through *Scientia Pharm.*, 9 (1938), 84. (M. F. W. D.)

Drug Ash—Composition of. The Detection of Some Constituents in Small Amounts in Drug Ash. The detection of phosphoric and silicic acids, manganese, aluminum, nickel and copper in the ash from 1 Gm. of drug is described. To test for silicic and phosphoric acids, the drug is ashed in nickel crucibles and for the others in quartz crucibles. Phosphoric acid is tested for with ammonium molybdate, and after filtering out the yellow crystals of ammonium phosphomolybdate, the filtrate is treated with benzidine and sodium acetate; the appearance of a blue color indicates silicon. Manganese is tested for by dissolving some of the ash in dilute sulfuric acid and warming with sodium periodate; a purple color indicates manganese. When the ash is treated with an alcoholic solution of morin and then with a solution of sodium acetate, a yellow-green fluorescence indicates aluminum. Nickel is tested for with dimethylglyoxime. The acid solution of the ash is treated with an excess of ammonia, filtered and the filtrate treated with hydrocyanic acid and an alkaline solution of phenolphthalein; a red color indicates copper.—L. ROSENTHALER. *Pharm. Acta Helv.*, 13 (1938), 101. (M. F. W. D.)

Easton's and Parrish's Syrup—Iodimetric Method for the Determination of Iron in. Attention is drawn to the advantages of a modification of Rupp's method for the determination of iron in official syrups. The accuracy of the method is shown in comparison with the titanous chloride method. It is shown that slightly low results are obtained in the determination of iron by the titanous chloride method and by the iodimetric method if alkaloids and sugars be present. —J. C. PENMAN and T. H. HOPPER. *Pharm. J.*, 141 (1938), 297. (W. B. B.)

Elements—Micro Tests for, in Organic Compounds. Several fusion mixtures were tested and it was found that a mixture of dextrose and sodium carbonate (1:10) was satisfactory in most cases. Where this mixture gave negative results for nitrogen another mixture of powdered zinc and sodium carbonate (2:1) was used. The substance was triturated with three to four times its weight of fusion mixture and introduced into a capillary tube about 5 cm. long x 1 mm. diameter to a depth of 0.5–1.0 cm. More of the fusion mixture was added to an additional centimeter. The tube was heated from the open end down over a small non-luminous flame (an alcohol flame was found best). Finally the tube is heated directly in the flame. The molten part of the tube is

pressed into a micro crucible containing a few drops of water. The resulting solution is twice heated to boiling for an instant. Drops suitable for testing are withdrawn by means of a fine capillary tube. To test for sulfur, two separate small drops are placed on a white spot plate and a drop of sodium plumbate solution and a drop of fresh sodium nitroprusside solution is added respectively. To test for nitrogen, a drop of the solution is placed on a microscope slide and a trace of strong freshly prepared ferrous sulfate solution is added. The mixed drop is heated just to boiling and cooled immediately. Dilute hydrochloric acid is then added till effervescence ceases and the solution is boiled. After cooling the drop is taken up and expelled on a spot paper. A blue spot indicates nitrogen. To test for halogens, a drop of the solution on a microscope slide is acidified with nitric acid, boiled and tested with silver nitrate solution.—C. L. WILSON. *Analyst*, 63 (1938), 332. (G. L. W.)

Ethyl Alcohol—Modification of the Nicloux Method for the Microdetermination of. The hot acidified solution containing the alcoholic distillate is titrated with standard potassium dichromate solution, using leucomethylene blue on a spot plate as outside indicator.—A. IONESCO-MATIU and C. POPESCO. *Bull. soc. chim. biol.*, 10 (1937), 911–914; through *Chimie & Industrie*, 39 (1938), 1079–1080. (A. P.-C.)

Ethylene Dibromide—Determination of. Ten cc. of 20 to 30% potassium iodide solution and 50 cc. of alcohol are placed in a 250 cc. flask and the sample to be analyzed is added. The flask is then fitted to a water-cooled condenser by a ground joint and the liquid is heated sufficiently to maintain a gentle reflux for 180 minutes. At the end of this period the source of heat is removed, the flask and contents are allowed to cool to room temperature, and the condenser tube is rinsed with a few 10-cc. portions of water. The liberated iodine is then titrated with 0.01 or 0.1*N* sodium thiosulfate. Sufficient water is added to the flask to bring the total volume to approximately 250 cc., to minimize the effect of the alcohol upon the starch-iodine end point.—M. W. BRENNER and G. L. POLAND. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 528–529. (E. G. V.)

Fatty Acid Titration—Free, Isopropyl Alcohol as a Solvent for. Preliminary tests with crude and extracted cottonseed oils using β-propyl alcohol as solvent yielded concordant results for free fatty acid content, identical with those obtained in the ordinary way with denatured ethyl alcohol; dry β-propyl alcohol is fully miscible with the oil, but the presence of more than 1% of water produces separation, which does not, however, appear to affect the titration.—G. W. AGEE. *Oil and Soap*, 15 (1938), 189–190; through *J. Soc. Chem. Ind.*, 57 (1938), 1187. (E. G. V.)

Fatty Acid Titration—Free, Isopropyl Alcohol as a Solvent for. β-Propyl alcohol has been used satisfactorily: after the titration, anhydrous β-propyl alcohol may be recovered (85–90% yield) by distilling the soap mixture, dehydrating the constant-boiling aqueous distillate with solid sodium hydroxide, separating the alcoholic layer and redistilling this.—C. R. BROWN. *Oil and Soap*, 15 (1938), 208; through *J. Soc. Chem. Ind.*, 57 (1938), 1187. (E. G. V.)

Fluidextracts—Testing, by Capillary Analysis. A long strip of filter paper 2 cm. wide is suspended vertically with the end immersed in 5 cc. of the fluidextract. After the liquid has been absorbed and evaporation is complete the stains on the paper, which usually show distinct zones for the different substances present, are compared with those similarly obtained with a pure standard fluidextract. Examination for fluorescence under the ultraviolet lamp is also useful. Glycerol interferes by preventing drying. Fifteen references are given.—A. M. LEAL. *Noticias farm.*, 4 (1938), 447–459; through *Chem. Abstr.*, 33 (1939), 315. (F. J. S.)

Formaldehyde—Microdetermination of, by Means of the Dimedon Method. This reaction was found to be suitable for determining the formaldehyde content of formolized diphtheria toxin used in prophylactic diphtheria immunization. Formaldehyde once combined in the toxin solutions is not split off by the addition of dimedon in order to unite with the latter. Since the reaction of formaldehyde with dimedon on the one hand and with other aldehyde-binding substances on the other are both time reactions, it follows that, so long as the formaldehyde added to the toxin solution is combining with these substances in the latter with great rapidity, the dimedon method always gives lower values for free formaldehyde. As the formaldehyde already present in a combined state is partially split off by distillation, it is not advisable to distil the solution to remove substances which interfere with the determination of formaldehyde. The amount of formaldehyde which can be determined in diphtheria toxoid by use of this method is about 0.3–10.0 mg.

—T. UCHINO and I. HOSAKA. *Japan J. Exptl. Med.*, 16 (1938), 227–237; through *Chem. Abstr.*, 33 (1939), 193. (F. J. S.)

Formic Acid—Determination of. A simplified and efficient procedure for the determination of formic acid is described, using a fritted-glass disk absorber to determine the carbon dioxide produced by the oxidation of the formic acid with mercuric acetate solution.—J. D. REID and H. D. WEIHE. *Ind. Eng. Chem., Anal. Ed.*, 30 (1938), 271–272. (E. G. V.)

Hydrogen Peroxide—Manganese as a Catalyst in the Determination of, by Means of Potassium Bromate. To 25 cc. of hydrogen peroxide solution add 1 Gm. of manganous chloride and titrate dropwise with decinormal potassium bromate, until the color is yellow. Heat to 40° C. and add enough potassium bromate solution to restore the yellow color. The results agree with those obtained by potassium permanganate titration. Manganous sulfate can be used in place of the chloride but the solution should be warm at the start and the end-point approached more gradually.—L. SZEBELLEDY and W. MADIS. *Z. Analyt. Chem.*, 109 (1937), 391–396; through *Chimie & Industrie*, 39 (1938), 1070. (A. P.-C.)

Iodine Content in Homeopathic Preparations of Fucus Vesiculosus. The authors employed the method of Autenreith and a stage photometer and carbon tetrachloride as a solvent instead of chloroform. Seven samples of the drug from three commercial sources showed an iodine content of 0.023–0.064% and mother tinctures prepared from these using powders of two sizes (sieve $^4/_6$ and sieve $^5/_6$) and the yield of iodine increased with the fineness of the powder. In a table this data in mg. and % as well as the % residue from the mother tincture at 100° C., the measurements of capillary streaks with a color comparator under the quartz lamp for the seven samples and the two degrees of fineness are given.—F. SONNTAG and G. KUHLMANN. *Deut. Apoth. Ztg.*, 53 (1938), 1047–1049. (H. M. B.)

Iodine—Determination of, in Organic Substances. Place 5 cc. of 63% nitric acid and 1 Gm. of mercuric nitrate in the Carius bomb tube and add 80 to 180 mg. of the substance to be analyzed; seal the tube and heat in the usual way. If less than 70 mg. of iodine is present in the sample, the resulting liquid is clear. Open the tube and add 20 cc. of normal calcium hypochlorite; any crystalline mercuric iodide present (if the sample contained more than 70 mg. of iodine) dissolves on shaking the tube. Transfer the solution to a flask, make up to 200 cc. with water, heat to boiling, decompose the excess of hypochlorite by the careful addition of 2 cc. of 20% sodium formate solution, add 4 Gm. of solid potassium iodide and titrate the solution with tenth-normal thiosulfate, using starch indicator at the end of the titration; 1 cc. = 2.1155 mg. of iodine. The method has an accuracy of 0.2 to 0.3%.—H. DOERING. *Ber. Deut. Chem. Ges.*, 70 (1937), 1887–1889; through *Chimie & Industrie*, 39 (1938), 864. (A. P.-C.)

Iodine—Microdetermination of, by a Catalytic Method. A method for the determination of minute quantities of iodides in 1 cc. of sodium chloride solution or in the solid salt is based on the strong catalytic action exerted by the iodine ion toward the reaction of ceric sulfate with excess arsenious acid in dilute sulfuric acid. A solution of ferrous sulfate and *o*-phenanthroline is used as indicator. The method gives satisfactory results with quantities of iodine of the order of 0.0005 to 0.003 mg.—E. B. SANDELL and I. M. KOLTHOFF. *Mikrochim. Acta*, 1 (1937), 9–25; through *Chimie & Industrie*, 39 (1938), 858. (A. P.-C.)

Juniperus Sabina—Colored Reaction of The extract of the plant at 5% concentration is shaken with ether, and the solvent is evaporated; concentrated hydrochloric acid is added to the residue; the solution becomes pink, then red-green (dichroic), and the color increases with heat or with addition of piperonaldehyde; if vanillin is added to the hydrochloric acid solution, the liquid becomes violet.—G. CHESSA. *Chimica*, 13 (1937), 89; through *Chimie & Industrie*, 39 (1938), 1149. (A. P.-C.)

Lead—Determination of, in Drinking Water. A sampling device which may be attached to the household water tap is equipped with a meter and a filtering agent composed of a mixture of magnesium oxide (10%) and calcium carbonate (90%). This filtering material removes both suspended and dissolved lead so that it can no longer be detected in the filtered water with hydrogen sulfide. After the filtration of a large volume of water the filtering medium is dissolved in nitric acid, filtered and washed (A). The insoluble residue (B) is reserved for further treatment. A is neutralized with ammonia water and a precipitate of lead and copper chromate is obtained with 200 cc. of 1% potassium chromate solution. The precipitate is filtered after boiling and cooling through a Jena glass filter, washed and dissolved with warm, dilute hydrochloric acid and

boiling water. This solution is repeatedly evaporated to dryness with concentrated hydrochloric acid till no more chlorine is evolved and then taken up with water and filtered (C). The insoluble residue is combined with B and treated with hydrofluoric acid to remove silica. The excess of sulfuric acid is removed from the silica-free residue by evaporation and the residue combined with C. The solution is acidified with 1 cc. of hydrochloric acid, diluted to 1000 cc. and, if copper is present only in small amount, 0.05 to 0.1 Gm. of copper as sulfate is added and the lead and copper precipitated as sulfides. The sulfides are filtered and dissolved in hot concentrated nitric acid. The solution is evaporated, redissolved in nitric acid and electrolyzed. The lead is deposited as peroxide and is then dissolved from the electrode and determined either gravimetrically as sulfate or colorimetrically as sulfide.—H. INGLESON. *Analyst*, 63 (1938), 546. (G. L. W.)

Lead—Determination of Small Amounts of, by Means of Dibromohydroxyquinoline. II. Slightly alkalinize with ammonia a dilute solution of lead nitrate containing small amounts of tartaric acid and 10% of acetone, and add dropwise 0.5% dibromohydroxyquinoline in acid solution at 55° to 60° C. with constant stirring. Coagulate by heating on a water bath, filter the yellow flake-like precipitate, wash with warm water containing a few cc. of acetone, then with pure warm water and finally dry at a gradually increasing temperature (up to 195° to 215° C.). The precipitate contains 25.55% of lead. In the presence of copper, lead should be determined by the indirect method: determine copper by the R. Berg method in acid solution and lead and copper together by the above method. Determine the lead and copper together in the presence of antimony and tin in the same manner as for lead alone in the presence of these components.—A. M. ZANKO and A. I. BOURSOUK. *J. Prikl. Khim.*, 9 (1936), 2297–2301; through *Chimie & Industrie*, 39 (1938), 857. (A. P.-C.)

Magnesia—Palmitate Determination of, in Water. Errors in the determination of magnesium and calcium in water as outlined by Kitto (*Analyst*, 63 (1938), 169) are pointed out. The author determines magnesium first by precipitating it from boiling solution with $N/10$ sodium hydroxide solution at a definite p_H range (about 9.5 to 10.0) and then back titrating the slight excess of sodium hydroxide in the filtrate with $N/10$ hydrochloric acid. The calcium may be determined by subtracting the magnesium hardness from the total hardness or by titrating the calcium in the filtrate with a standardized solution or potassium palmitate or stearate using bromthymol blue as indicator.—H. ATKINSON. *Analyst*, 63 (1938), 493. (G. L. W.)

Mercurous Salts—New Electrometric Method for the Determination of. The system consists of two electrodes, one of them dipping in the solution of mercurous salts to be titrated, the other in a solution of iodine and potassium iodide.—E. MICHALSKI. *Roczniki Chem.*, 17 (1937), 83–87; through *Chimie & Industrie*, 39 (1938), 1069. (A. P.-C.)

Mersalylum—Determination of. A new and more rapid method for the determination of the mercury in mersalylum is described. It is recommended that this be substituted for the present process, and that a method be included for the determination of the salicyllylamide-*o*-acetic acid, this would enable the present determination of the nitrogen content to be deleted from the monograph.—C. E. WATERHOUSE. *Pharm. J.*, 141 (1938), 275. (W. B. B.)

Methyl Alcohol—Presence and Determination of Traces of, in Perfumery Products. Commercial perfumes and industrial ethyl alcohol may show 0.04–0.08% of methyl alcohol by the official Dutch method of determination (oxidation to formaldehyde under standard conditions). 0.1% should be permissible without accusation of fraud, for example, through using ethyl alcohol denatured with methyl alcohol. The low boiling fraction of the ethyl alcohol tested gave a negative result, showing that methyl alcohol itself was absent. Some perfumes, especially after being kept, may contain methyl alcohol.—P. HONIG. *Rec. trav. chim.*, 57 (1938), 770–775; through *J. Soc. Chem. Ind.*, 57 (1938), 1099. (E. G. V.)

Methylene Blue as a Reagent for Cerium. To 45 cc. of the solution under examination contained in a 50-cc. Nessler tube add, dropwise, sufficient $5N$ sulfuric acid to render the liquid distinctly acid; then one drop of hydrogen peroxide (100 vol.) and one drop of 0.05% aqueous solution of methylene blue. Shake the tube and add sufficient $5N$ sodium hydroxide solution to make the solution distinctly alkaline. In the presence of one part (or more) of cerium per million a green color is produced. A blank test gives a blue color resembling that of copper sulfate. The green color is not discharged on acidification with acetic acid.—R. A. REED. *Analyst*, 63 (1938), 338. (G. L. W.)

Microcombustion Tubes—Electrolytic Silver Wool in the Filling of. Finely divided silver wool may readily be prepared electrolytically. When removed from the electrolytic cell the crystals have a diameter of 0.005 to 0.05 mm. and are 3 to 8 mm. long; they are in the form of closely interwoven clusters and are conveniently handled in the pincers in filling the combustion tube. In general 2 to 3 Gm. of crystals will take the place of 4 to 5 Gm. of wire, since the crystals present a much greater surface.—W. MACNEVIN. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 341. (E. G. V.)

Nitrite—Determination of, in Waters. A colorimetric method which differs from the Ilosvay modification of the Greiss method by employing a solution of sulfanilic acid and α-naphthylamine in 1:4 sulfuric acid. The coupling of the diazotized sulfanilic acid with the α-naphthylamine is brought about by the addition of a slight excess of sodium acetate solution. Comparison is made with a standardized solution of fuchsin or with standard color glasses.—W. G. MOFFITT. *Analyst*, 63 (1938), 655. (G. L. W.)

Nux Vomica Preparations—Galenical, Determination of Alkaloids in. A comparative study of the methods of Léger and of the Italian, Belgian, British and German pharmacopœias, was carried out on a sample containing 2.5% alkaloids. On the whole the results were entirely concordant. It should be noted that the Belgian (gravimetric) and British methods require much more time than the others. On products with very high alkaloids content (16%) the Italian methods give lower results (about 1%) than Léger's. This may be overcomed by increasing the amount of ether-chloroform mixture used for extraction or by extracting with benzene.—D. PONTE. *Boll. chim.-farm.*, 76 (1937), 223–224; through *Chimie & Industrie*, 39 (1938), 1149. (A. P.-C.)

Organic Halogen—Determination of. The sample is weighed in a gelatin capsule and ignited in a Pyrex tube filled with hydrated lime. Combustion takes place in a short tube furnace, the contents are dissolved in nitric acid and the solution is titrated directly for chloride or bromide without filtration.—R. H. KIMBALL and L. E. TUFTS. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 530–531. (E. G. V.)

Oxalic Acid—Determination of. The method is suitable for urine and other solutions containing as little as 10 mg. oxalic acid per liter. A 400–450-cc. sample is acidified with hydrochloric acid and extracted with ether for 72 hours in a continuous extraction apparatus. If the time is shortened extraction is incomplete. The ether is evaporated and the oxalic acid determined in the residue by the micromethod previously described (LEULIER, VELLUZ and GRIFFON, *C. A.*, 23, 5130).—A. LEULIER and J. DORCHE. *Bull. soc. chim. biol.*, 20 (1938), 939–946; through *Chem. Abstr.*, 33 (1939), 192. (F. J. S.)

Perfumes and Toilet Water—Odoriferous Substances in, Determination of the Content of. The determination is made in the Cassio flask with the neck graduated in 0.01 cc. The flask is charged with 10 cc. of the toilet water, 0.5–1 cc. benzene and sodium chloride or ammonium sulfate solution (d. 1.145–1.185) and digested on a water bath at 60–70° for 15 minutes. It is then compared with 10 cc. alcohol of an equal density treated likewise with benzene and a salt solution. Perfumes (25 cc.) are diluted with 28 cc. alcohol and 7 cc. water and an aliquot part (10 cc.) is treated as above.—A. I. NAIMARK and N. A. SUVOROVA. *Masloboino Zhirovoe Delo*, 14, No. 4 (1938), 26–27; through *Chem. Abstr.*, 33 (1939), 807. (F. J. S.)

Reaction Equilibria of Importance in Chemical Analysis. The equilibrium constant of the reaction $AgCl + SCN^- \rightleftarrows AgSCN + Cl^-$ (reached in 15 minutes) is 176 at 12° to 16° C., which is in good agreement with the theoretical value of 177. Nitric acid does not affect the equilibrium constant. The results justify the removal of silver chloride in the titration of chlorides by the Volhard method, in order to avoid reaction of the iron sulfocyanide formed toward the end of the titration with the silver chloride.—N. A. TANANAÏEV and N. V. CHTCHERBINA. *J. Prikl. Khim.*, 10 (1937), 545–548; through *Chimie & Industrie*, 39 (1938), 859. (A. P.-C.)

Rye Ergot—Extract Content of. No relation could be found between acid value and extract content. Determination of extract alone is not sufficient for evaluation, since acid and extract contents can increase significantly during storage.—P. LIPTAK and I. SZENTGALI. *Magyar Gyogyszereszt. Tars. Ert.*, 13 (1937), 266–270; through *Chimie & Industrie*, 39 (1938), 1151–1152. (A. P.-C.)

Santonin—Gravimetric Determination of, in Semen Contra. The method of Fernandez and Socias with dinitrophenylhydrazine gives too high results. The following technic is recom-

mended: moisten 5 Gm. of Semen Contra with equal parts of ammonia solution and water, leave to dry at room temperature or at 37° C.; grind, and extract with benzene; evaporate the benzene, dissolve the residue in 40 cc. of a saturated solution of barium hydroxide by heating for 10 minutes at 100° C., filter and wash twice with 10 cc. of baryta water; cool while protecting from light; add 5 cc. of 25% hydrochloric acid and keep in a cool place for 24 hours to permit crystallization; collect the crystals, wash twice with 10 cc. of water, dry and weigh. Dinitrophenylhydrazine precipitates other substances besides santonin.—M. M. JANOT and M. MOUTON. *Bull. sci. pharmacol.*, 43 (1936), 708–713; through *Chimie & Industrie*, 39 (1938), 932.

(A. P.-C.)

Succus Juniperi Inspissatus—Investigation of. Determination of density, dry substance, mineral constituents, their alkalinity, acid number, sugar estimation, starch, etc., is considered.—J. DEININGER. *Suddeut. Apoth.-Ztg.*, 78 (1938), 733–735; through *Chem. Abstr.*, 33 (1939), 314.

(F. J. S.)

Sulfanilamide—Identification of. The following tests serve to identify sulfanilamide: (1) One drop (0.04 cc.) of 100 mg. % sulfanilamide solution, 1 drop of 40% formalin and one drop of 10% sodium carbonate were mixed on a microscope slide and the mixture was evaporated to dryness on a water bath. The residue was extracted with 2-drop portions of warm water until free of soluble salts. The product (m. p. 235–240°, decomposition) appeared as transparent spheres at high magnifications. It was soluble in caustic and warm concentrated hydrochloric acid. The test is sensitive to one drop of 30 mg. % solution, or 12 gamma. (2) One drop of sulfanilamide solution (50 to 100 mg. %) and 1 drop of iodine monochloride solution were evaporated to dryness. A drop of water was added to dryness and a second drop of hot water was added, the mixture was stirred, and drawn off with absorbent filter paper. Alkali-soluble, water- and acid-insoluble needles were obtained (m. p. 265°, decomposition). Purification was repeated when the crystals were colored, and occasionally it was necessary to evaporate the product with a drop of dilute alcohol to obtain good crystals. The iodine monochloride solution was prepared by adding slowly and with stirring 6.6 Gm. of sodium iodate to 11.0 Gm. of potassium iodide in 85 cc. of 6*N* hydrochloric acid. (3) One drop of concentrated hydrochloric acid and 1 drop of sulfanilamide solution were evaporated to dryness. The hydrochloride (m. p. 235–237° C.) was converted to the picrate by the addition of a small drop of saturated picric acid solution. The test is sensitive to 1 drop of 30 mg. % solution: long yellow needles (m. p. 179–180°). (4) To one drop (0.04 cc.) of sulfanilamide solution and 1 drop of mercuric nitrate solution, one drop of 10% sodium carbonate was added. A highly flocculated, transparent, white precipitate formed. The particles were extremely small. It was not found possible to single out crystals of good definition. The test is best performed in a dark field or against a black background. Macroscopically the substance has a yellow tint. It dissolves in dilute acids and the sulfanilamide group may be diazotized. The mercuric nitrate reagent was prepared by dissolving a small amount in water with sufficient nitric acid to prevent precipitation upon dilution. It was then diluted until, when mixed with an equal volume of 100 mg. % sulfanilamide, it gave a pure white precipitate upon the addition of sodium carbonate (10%). At this dilution, addition of sodium carbonate to the reagent alone imparted only a slightly yellow tinge to the solution. (5) One mole of sulfanilamide (0.400 Gm.) and one mole of silver nitrate were dissolved in 120 cc. of water and 2 drops of concentrated ammonium hydroxide were added. A white precipitation occurred. The reaction mixture was boiled and filtered hot and on cooling white needles separated. The yield was 0.280 Gm. or 43%. (6) Treatment of sulfanilamide hydrochloride with urea gave poor yields of the product. The yields were increased slightly upon prolonged treatment, with renewal of urea. The product is soluble in caustic, insoluble in acids and may be hydrolyzed by hot acids, liberating sulfanilamide: white needles (m. p. 270–271°, decomposition). (7) A few small crystals of sulfanilamide treated on a microscope slide with a drop of acetic anhydride were observed to change to the acetylsulfanilamide. Washed with ether, the produce melted at 214°. When 2 cc. acetic anhydride were used and the mixture was boiled over a microflame, crystals of the diacetylsulfanilamide separated on cooling. Washed with ether the product, white needles, melted at 240–242°, with decomposition. In macroscopic amounts the sulfanilamide was boiled for 10 minutes in an excess of acetic anhydride. The product did not diazotize. Hydrolysis at 100°, with 2*N* hydrochloric acid, liberated sulfanilamide. Recrystallized from dilute alcohol (m. p. 244°, decomposition).—J. V. SCUDI. *Ind. Eng. Chem., Anal. Ed.*, 10 (1938), 346. (E. G. V.)

Tannins—Estimation of, According to the Method of Schulte. Two commercial tannin samples yielded on extraction only 50–60%, referred to the dry substance. As was anticipated, digitonin appears entirely in the final extraction, the milky turbidity of which on cooling was in part due to various *Scrophulariaceæ*. In experiments with quillaja saponin only a portion was recovered, probably because of interference of other saponins. Quillaja saponin, in contrast to spinach saponin, can be fixed to hide powder in very considerable amounts. It is well known that hide powder can in addition to tannins fix organic acids, phenols and pectins or otherwise adsorb them.—H. VOLLMER and E. CHYTREK. *Suddeut. Apoth.-Ztg.*, 78 (1938), 789–790; through *Chem. Abstr.*, 33 (1939), 314. (F. J. S.)

Thallium—Bromometric-Potentiometric Titration of, with Chloramine. Chloramine reacts with water to form $CH_3C_6H_4SO_2NH_2$, hypochlorous acid and sodium hydroxide. The hypochlorous acid formed will react with hydrochloric acid and potassium bromide to form free bromine, which is capable of oxidizing univalent thallium to the trivalent state. In the experiments described, a platinum wire was used as one electrode and a normal calomel cell as the other. The latter was connected with the solution by a siphon tube filled with saturated potassium sulfate solution. Ten-cubic centimeter portions of decinormal thallous nitrate solution were treated with 10 cc. of 10% potassium bromide solution + 5 cc. of twice normal hydrochloric acid + 35 cc. of water and the mixture was titrated slowly at room temperature with decinormal chloramine solution. The results of 11 experiments were all within 2% of theoretical.- C. DEL FRESNO and A. AGUADO. *Z. Analyt. Chem.*, 109 (1937), 334–338; through *Chimie & Industrie*, 39 (1938), 1070. (A. P.-C.)

Thallium—New Micromethod for the Determination of, by Potentiometric Titration with "Thionalide." "Thionalide" is the β-aminonaphthalide of thioglycolic acid. Under certain conditions it gives a stable complex (even in presence of salts) with the thallous ion in sodium hydroxide solution containing sodium tartrate and potassium cyanide. Two methods are available for determining thallium by thionalide: (1) the precipitate formed is decomposed with sulfuric acid and perhydrol and the liberated thallous ion is titrated potentiometrically by the bromometric method; (2) the organic portion of the precipitated complex is converted by means of iodine into dithionalide, the formation of which is detected potentiometrically.—R. BERG and E. S. FAHRENKAMP. *Mikrochim. Acta*, 1 (1937), 64-70; through *Chimie & Industrie*, 39 (1938), 858. (A. P.-C.)

Theophylline—Sensitive Reaction for the Quantitative Measurement of, in the Presence of Sodium Acetate and Ethylenediamine. A solution of theophylline in absolute methyl alcohol forms an insoluble compound when a solution of copper acetate in methyl alcohol is added. Precipitation is complete after 90 minutes. The compound is then centrifuged, washed with absolute methyl alcohol and recentrifuged to remove excess copper acetate. Since the compound is of constant composition containing one part of copper to two parts of theophylline, a determination of the copper content may be used as a measure of the theophylline present. For this purpose the compound is dissolved in 0.2*N* sulfuric acid and the copper titrated iodometrically with .02*N* sodium thiosulfate. Since sodium acetate and ethylenediamine do not influence the precipitation in any way, their removal is unnecessary making possible a direct determination of theophylline in the official preparations containing these substances. Caffeine and theobromine do not interfere as caffeine, although soluble in the alcohol, does not react with the copper acetate, while theobromine is insoluble. Theophylline in concentration as low as 0.006% will respond to the test. Up to 0.12% the theophylline is quantitatively precipitated. Above this level the amount of precipitate is less than theoretical but gives a reproducible value for each concentration.—ALBERT J. PLUMMER and WALTER L. MENDENHALL. *J. Pharmacol.*, 63 (May 1938), 31. (H. B. H.)

Thymol—Chemico-Toxicological Detection of. The viscera to be examined are treated with alcoholic caustic soda solution to break down the compounds of thymol with albuminoids, excess alcohol is added and the mixture is filtered, the thymol passing into the filtrate as sodium thymolate. The alcohol is evaporated, the residual aqueous liqiud is acidified with sulfuric acid and extracted with ether to remove thymol; the ether is allowed to evaporate spontaneously and the residue is tested for thymol. The addition of a few drops of concentrated sulfuric acid and a drop of formaldehyde to a minimum amount of thymol causes immediate violet streaks which immediately turn to maroon. Although such color reactions are common to all the phenols, the

shades and changes are considered distinctive.—L. PILATI. *Boll. chim.-farm.*, 76 (1937), 301–305; through *Chimie & Industrie*, 39 (1938), 865. (A. P.-C.)

Tin—Determination of, by Means of Phenylarsinic Acid. Tin phenylarsinate precipitated with phenylarsinic acid should not be ignited in platinum crucibles over a gas burner, stannic oxide being easily reduced and partly volatile; moreover, tin injures platinum crucibles. The precipitate should therefore be ignited in porcelain or quartz crucibles in a muffle at a temperature of not less than 1000° C. Presence of small quantities of zirconium, niobium, tantalum or tungsten interferes, as these metals are precipitated along with the tin. The same is true of large quantities of molybdenum, lead, copper, antimony, iron, thorium and especially titanium.—I. P. ALIMARINE and M. S. VEJENKOVA. *Zav. Lab.*, 6 (1937), 644–645; through *Chimie & Industrie*, 39 (1938), 1073. (A. P.-C.)

Vagotonin—Some Physical and Chemical Properties of. Pure vagotonin is an amorphous, white powder, slightly hygroscopic, very soluble in water; soluble in 75% alcohol. It is practically insoluble in 95% alcohol but if freed from the last traces of salts by dialysis it becomes soluble. It is soluble in dilute pyridine, 70% methanol and 70% acetone; insoluble in anhydrous methanol, ethanol, acetone and glycerol; insoluble in ether, chloroform, carbon disulfide, benzene, toluene; soluble in phenol but not in cresol. At a p_H below 3.2 it is salted out by sodium chloride, potassium chloride, lithium chloride, ammonium sulfate and potassium ferrocyanide. It is precipitated by picric, phosphotungstic and phosphomolybdic acids, trichloroacetic acid, uranium acetate and other protein precipitants. It does not diffuse through membranes. The isoelectric point is at p_H 4.6 to 4.7. It contains reduced sulfur but no phosphorus. All common protein reactions are positive. The spectral-absorption curve shows peaks at 275 and 243 mμ and a minimum at 254 to 256 mμ. The Seliwanoff reaction is positive (that of insulin is negative). Its physiological activity is destroyed by acids but not by alkalies (opposite of insulin). Other properties of vagotonin and insulin are compared.—D. SANTENOISE, TH. BRIEU and E. STANKOFF. *Compt. rend. soc. biol.*, 124 (1937), 127–130; through *Chimie & Industrie*, 39 (1938), 933. (A. P.-C.)

Vitex Negundo—Constituents of the Leaves of. Mature leaves of *Vitex negundo* gathered in September and October yield upon extraction with cold alcohol, glucononitol, *p*-hydroxybenzoic acid, 5-hydroxyisophthalic acid, 3,4-dihydroxybenzoic acid and a glucoside. Fresh leaves gathered in February and March also yield glucononitol, *p*-hydroxybenzoic acid and 3,4-dihydroxybenzoic acid and a glucoside which upon hydrolysis gives *p*-hydroxybenzoic acid and a second glucoside.—T. P. GHOSE and S. KRISHNA. *J. Indian Chem. Soc.*, 13 (1936), 634–640; through *Chimie & Industrie*, 39 (1938), 930–931. (A. P.-C.)

PHARMACOGNOSY

VEGETABLE DRUGS

Codex Alimentarius—Czechoslovak, Some Notes Pertaining to. II. Mustards. Analyses of white, yellow and brown mustard seeds from Bohemia and Rumania are given in tables.—J. KOBLIC. *Chem. Obzor*, 13 (1938), 168–170; through *Chem. Abstr.*, 33 (1939), 1096. (F. J. S.)

Cork Industry in Algeria. The first step in collecting the cork is known as demasclage. During the months from May to July suitable trees have the "male" or "virgin" cork removed. Until the tree has attained a circumference of 32 in. at a height of six feet from the ground it is regarded as unsuitable. The length of the "barrel" removed is two and a half times the circumference, *i. e.*, for a 32-in. tree the barrel is 6 ft. 8 in. high. The operation needs great care so as not to wound the tree or damage the tissue which gives rise to the "female" bark. The male bark so obtained is full of cracks, and is hard and brittle. Formerly it was discarded as useless, but is now ground and used in the manufacture of linoleums and similar materials. The time taken for the new layer of cork to become of a sufficient thickness varies with the altitude, from eight to fifteen years being the usual limits. When the cork is ripe it must be gathered within a definite number of years or it becomes wooden and loses its elasticity and value. The female bark is removed with the same precautions. The production of a single tree varies according to the size of the tree and the zone where it grows. It may be taken as a rule, however, that a tree having 80 cm. circumference and male bark removed to a height of two meters will give about 25 Kg. (55 lb.) of female bark. Seven kilos of bark from one square meter of generating surface is considered to be a

good average. The different forms exported from Algeria are: *Raw Bark.*—Good quality bark, as removed from the tree; *Boards.*—The cork is first boiled for an hour, then scrapped and trimmed; *Finished Cork.*—Exported as bottle corks, squares, floats for fishing nets, etc; and scraps and waste. The uses of cork are numerous, quite apart from its age-old use for stopping bottles.—ANON. *Chemist and Druggist*, 128 (1938), 20. (A. C. DeD.)

Croton Seed—New, from Nyasaland. Seed identified as *Croton megalobotrys* Muell. Arg. (*C. gubouga* S. Moore) yielded 49.8% of semi-drying oil on the moisture-free kernels (29.6% on the entire seed). The oil had the following characteristics: specific gravity at 15.5° C. 0.9292, refractive index at 20° C. 1.4756, acid value 1.5, saponification value 196.5, iodine value (Wijs, 30 minutes) 129.2, unsaponifiable 0.9%.—ANON. *Bull. Imp. Inst.*, 36 (1938), 151–153. (A. P.-C.)

Drugs—Increasing Significance of, for Pharmacists. A review of the changing trends in the use of vegetable drugs.—ANON. *Wien. Pharm. Wschr.*, 71 (1938), 42–44. (M. F. W. D.)

Ipecac—Determination of Stem in. The sclerenchymatous cells of ipecac stem are of a pale yellow color, have a bright transparency after "crude fiber" treatment, and have thick walls with characteristic canals running outwards. These cells can readily be distinguished from xylem elements, which they resemble superficially, in that the xylem cells have comparatively thin walls and a characteristically pitted appearance. The sclerenchymatous cells do not terminate in a tapering, pointed apex, as do the xylem elements. *Procedure:* About 15 Gm. of the sample is passed through a No. 90 sieve, with regrinding if necessary. Exactly 10 Gm. of the mixed powder is weighed and transferred to a porcelain dish together with 50 cc. of 10% nitric acid. The contents are brought to the boil and allowed to boil gently for thirty seconds, gentle stirring being maintained. The boiling liquor is transferred as quickly and completely as possible, using boiling distilled water if necessary, to a sintered glass funnel (54 G2 or 3) attached to a pressure pump. The residue is washed thoroughly with boiling distilled water, using 100 to 150 cc. for the washing. The washed residue is then transferred completely to the dish and 50 cc. of 2.5% sodium hydroxide solution is added, boiling for thirty seconds. The liquid is again filtered through the same funnel, washing it first with hot 0.5% nitric acid and subsequently with boiling distilled water, any residue in the dish being rinsed on to the funnel with the weak acid. On completion of the washing, air is allowed to be drawn for a moment or two through the residue, after which the cake of crude fiber is transferred to a small tube containing a little suspending fluid (mucilage of tragacanth 1, glycerin 2, distilled water 1 by volume) previously mixed with 0.1 Gm. (9,400,000 spores) of air-dry lycopodium. After mixing intimately, small portions of suspending fluid are added, each of which has been used to rinse the funnel free of any remaining fiber. This is continued until a pasty liquid is obtained, a small amount of which evenly spread on a miroscope slide, and further diluted if necessary, is used for making the necessary counts. On account of the large number of lycopodium spores the counting was carried out by substituting for the metal disk a micrometer grid which divided the field diameter into tenths, and counting the number of spores in one of the two center sections of this grid. The slide was moved along, and at the end of the scan the count represented one-tenth of the total number of spores in the field-scan. *Calculations:* Factors; wt. of stem/wt. of lycopodium = × 100. Lycopodium average count per grid scan = 424. Factor; field-scan area/grid scan area = × 10. Average lycopodium spores per field scan = 424 × 10 = 4240. Cells per mg. of stem = 33. Therefore percentage of stem is sample =

$$\frac{\text{Cell average per field scan} \times 94{,}000 \times 100}{4240 \times 100 \times 33}.$$

Small percentages of ipecac stem can be determined with reasonable accuracy in samples of powdered ipecac root. One mg. of ipecac stem was found to contain 33 of the sclerenchymatous cells.—A. W. LUPTON. *Quart. J. Pharm. Pharmacol.*, 11 (1938), 223–233. (S. W. G.)

"Ja-Sho-Shi"—Pharmacognostic Examination of. "Ja-Sho-Shi," a tonic and aphrodisiac is derived from *Cnidium Monnieri* L. in China and *Torilis Anthriscus* Gmel. in Japan. The Chinese drug, its adulterant *C. Japonicum* Miq. and the poisonous fruits of *Cicuta virosa* can be differentiated by thin cross sections. The microscopic findings were summarized as follows: In the fruits of *C. Monnieri* spiral thickenings in the cell walls appear in the epidermis and parenchyma of the pericarp; hesperidin crystals in the cuticle. In the fruit of *C. Japonicum* the spiral thickenings are found only in the parenchyma of the pericarp, but not in the epidermis; chloro-

phyll is present in the seed coat. In the fruits of *C. virosa* there are groups of fibers and stone cells in the pericarp, chlorophyll is present in the seed coat. The fruits of *T. Anthriscus* are spiny and the commercial article is often mixed with the spiny fruits of *Caucalis scabra* Makino. The former are brown or green, the latter dark. They differ also in cross section. In the former there are 6 to 16 dorsal glands, whereas in the latter there is a single gland between each pair of ribs. The seed coat of the former is brown without chlorophyll, whereas chlorophyll is present in the latter.—N. FUJITA and N. NOSOKAWA. *J. Pharm. Soc. Jap.*, 56 (1936), 133–134.

(R. E. K.)

Ligusticum Actilobum—Constituents of the Fruits of. The cooled benzene extracts of the fruits of *Ligusticum acutilobum* Sieb. et Zucc. deposited bergaptene: m. p. 188°; no depression with authentic specimen; yield 0.4%. The filtrate after the removal of bergaptene was distilled under reduced pressure to obtain the volatile oil: yield, 2% d_{15}^{15} 0.9596, α_D^{16} −0.27°; n_D^{16} 1.48638; acid number 36.4; ester number 234.7; ester number after acetyl 294.8. After saponification, the neutral portion was fractionated and found to contain: (*a*) *p*-cymene: b. p. 170–175°; d_{15} 0.8606, n_D^{17} 1.49173; *p*-oxyisopropyl benzoic acid m. p. 160°; (*b*) *n*-dodecanol: b. p.$_3$ 113–18°; m. p. 22°; no depression with synthetic product; phenyl urethane, m. p. 75°; (*c*) *n*-tetradecanol: m. p. 36°; phenylurethane, m. p. 71°. This acid portion was found to be a new hydroxy acid, named ligusticumic acid, and characterized as follows: analysis $C_{12}H_{16}O_3$; b. p.$_{0.3}$ (after purification through methyl ester), 155–165°; lactone, $C_{12}H_{14}O_2$, b. p.$_7$ 182–184°, d_4 1.0919, *n* 1.5524; dihydro acid, $C_{12}H_{18}O_3$, b. p.$_{0.3}$ 158–160°; methyl ester, b. p.$_2$ 140–143°; amide, m. p. 136. The lactone possesses the characteristic odor of the roots and fruits of this plant.—KARIZONE, KANNO and SUGINO. *J. Pharm. Soc. Jap.*, 56 (1936), 113–116. (R. E. K.)

Medicinal and Condimental Plants—Cultivation of, in Germany. A review and summary with 122 references.—K. F. WEHLMANN. *Forschungsdienst*, 6 (1938), 171–178; through *Chem. Abstr.*, 33 (1939), 1096. (F. J. S.)

National Formulary Drugs—Studies of. Drugs studied were lappa, convallaria, stillingia and apocynum. The botanical and pharmacognostic portions of the monograph on Lappa in the N. F. VI were studied and suggestions for improvement are offered. There is also a history of the drug, means of distinguishing first-year and second-year root. Structure of the first-year root is described and recommendation made that restriction to first-year root be continued. It is suggested that a crude fiber standard be introduced. Similar consideration is given to convallaria, stillingin and apocynum.—HEBER W. YOUNGKEN. *J. Am. Pharm. Assoc.*, 28 (1939), 17.

(Z. M. C.)

Plant Juices—Crude, Chemical Investigation and Evaluation of, and Similar Preparations. The chemical and physical characters of the juices and residues were determined in connection with studies on pasteurization and keeping qualities, capillary pictures and luminescence analyses. Among the preparations particularly described and characterized are those of garlic (*Allium sativa*) "Burlauch" (*Allium ursinum*), onion (*Allium cepa*), horseradish (*Cochlearia armoracia*), celery (*Apium graveolens*), sauerkraut and carrots (*Sorbus aucuparia and domestica*).—W. PEYER and J. BREINLICH. *Suddeut. Apoth.-Ztg.*, 78 (1938), 790–794, 809–812, 819–820, 827–828, 833–836, 882–887; through *Chem. Abstr.*, 33 (1939), 1095. (F. J. S.)

Salvia Miltiorrhiza, Bunge—Pharmacognostic Study of Root of. There are two forms of the root of *Salvia miltiorrhiza*, one that is light and highly colored, the other which is heavy and contains less color. The former corresponds to the Mandchurian plant. Its roots possess a tonic action.—N. FUJITA and H. C. SHIM. *J. Pharm. Soc. Japan*, 57 (1937), 75–76; through *Chimie & Industrie*, 39 (1938), 1151. (A. P.-C.)

Vegetable Drugs—Crude, Appearance of, under Ultra-Violet Light. In this article the authors have tabulated the visible effects of ultra-violet light on fresh surfaces of amost every crude vegetable drug in the current National Formulary.—MARIN S. DUNN and WILTON H. KIMMER. *Am. J. Pharm.*, 109 (1937), 498. (R. R. F.)

Vetiver Oil—Réunion. The oil is produced in the Dutch Indies, especially Java, on Réunion Island and is distilled in Europe and America in modern distillation plants from roots imported mostly from Java. Cultivation, harvesting and distillation on the island are discussed. The oil on the basis of samples examined over a period of years has shown the following limits for the constants: sp. gr. (15° C.) 0.994–1.00, $(\alpha)_D$ + 18° to + 21° 41′, n_D^{20} 1.5420–1.5270, acid value 2.5–8.0, saponification value 14.0–17.7, ester value after acetylation 126.5–135.0, solubility (20°

C.) clear to slightly opalescent in 1.5–2.0 volumes of alcohol (80%) and clear to opalescent in more. Constants may vary considerably as they are influenced by the age and quality of the roots, length of the distillation, soil and weather conditions. The oil obtained by steam distillation is superior.—ERNEST GUENTHER. *Drug Cosmetic Ind.*, 43 (1938), 416–419, 422, 447. (H. M. B.)

Ylang Ylang Oil. A description of the Ylang Ylang country and plantations.—E. GUENTHER. *Am. Perfumer*, 37 (1938), 31–33. (G. W. F.)

PHARMACY

GALENICAL

Digitalis—Pills of, Pharmacological Investigation of. A pharmacological investigation of the stability of digitalis in the form of pills was made using guinea pigs as the test animals. When an ointment of glycerin is a pill constituent, the pills begin to lose their activity after standing a few days. After one month only one-half of the original activity was present. Cacao butter was found to be a better constituent. After standing one week, the pills still retained their original activity, but after one month, only 25% of the original activity was lost.—T. MALMSTRÖM. *Svensk Farmaceutisk Tidsskrift*, 29 (1937); through *Pharm. Ztg.*, 82 (1937), 1164. (N. L.)

Emulsions—Particle Size and Stability of. A discussion of the breaking of emulsions, avoiding de-emulsification and stable emulsions. The Brownian movement (and emulsion stability) decreases with the size of globules and the viscosity of the outer phase. The importance of particle size enhancing the stability of emulsions and dispersing agents are discussed.—H. COUTINHO. *Am. Perfumer*, 37 (1938), 34–37. (G. W. F.)

Galenical Preparations—Preservation of. Infusion of senna preserved with 0.1% of nipasol (*n*-propyl-*p*-hydroxybenzoate) or with 0.15% of nipagin (methyl *p*-hydroxybenzoate) showed no deterioration during five months' storage, whereas an unpreserved infusion having p_H 7.1, changed after twenty-four hours to p_H 6.6 and then gradually during two weeks to p_H 8.12; deterioration in the control was also shown by the change in color, development of turbidity and finally growth of moulds within fourteen days. Infusion of digitalis preserved with 0.05% of nipasol or with 0.15% of nipagin, retained its original potency for two months, as shown by the frog assay, and showed in that time no visible deterioration, whereas an unpreserved sample became turbid and changed color within a week and showed a loss of potency after ten days. Mucilage of acacia (French Codex) did not become acid for three weeks when preserved with 0.06% of nipasol or with 0.12% of nipagin, whereas an unpreserved sample became appreciably acid and visibly deteriorated in a few days.—L. FERNANDO and P. VALENZUELA. *Rev. Filipina Med.*, 29 (1938), 151; through *Quart. J. Pharm. Pharmacol*, 11 (1938), 655. (S. W. G.)

Medicinals—Decomposition of, in Aqueous Solutions Especially on Sterilization. X. A study was made of the stability of four local anesthetics—larokain, perkain, pantokain and panthesin. It was found that aqueous solutions of the above compounds were stable when subjected to sterilization by heat.—RICHARD DIETZEL. *Pharm. Zentralhalle*, 79 (1938), 322–325. (N. L.)

Phenol—Ointment of, Note on the Keeping Properties of. The loss of phenol from Phenol Ointment during the preparation of small quantities may be from 3.7 to 5.2% of the phenol added. Ointments prepared in accordance with the British Pharmacopœia and stored in pots at room temperature, lose phenol rapidly, and the strength may fall as low as 2%, after two years' storage. More rapid loss occurs at higher temperatures. Specimens stored in collapsible tubes show little loss of phenol after ten months' storage. Tables are given to demonstrate the above.—G. R. PAGE. *Pharm. J.*, 141 (1938), 264. (W. B. B.)