PHARMACEUTICAL ABSTRACTS

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CONTENTS

NEW REMEDIES

SPECIALTIES—(*Continued*)

Lanaclarin Ampuls (Sanabo Co., Vienna, 12th dist.) are sold in packages of 3 and 6 ampuls containing 2 cc. of solution equivalent to 0.40 mg. of the crystalline glycosides of *Digitalis lanata*. **Lanaclarin Solution** is sold in packages of 10 cc., each cc. of which is equivalent to 0.50 mg. crystalline glycosides. **Lanaclarin Tablets** are put up in packages of 12 tablets containing in each 0.50 mg. crystalline glycosides. **Lanaclarin Suppositories** are put up in packages of 5 containing in each 0.50 mg. crystalline glycosides.—*Pharm. Presse*, 42 (1937), 272. (M. F. W. D.)

Liquibarin Concentrate (Pharmazeutische Werke Norgine A. G., Aussig a. E.) contains barium sulfate, heavy oxide of magnesia and a glycosidal substance. The packages contain 100 Gm.—*Pharm. Presse*, 42 (1937), 201. (M. F. W. D.)

Mandicid-Liquid (Sanabo, G.m.b.H., Vienna, 12th dist.) contains 42% ammonium amygdalate in fluidextract of licorice and is sold in 240-Gm. packages.—*Pharm. Presse*, 42 (1937), 239. (M. F. W. D.)

Mydripaverin Tablets (Engel-Apotheke, Vienna, 1st dist.) are sold in packages of 10 or 20 tablets containing in each 0.0005 Gm. atropine methyl nitrate, 0.015 Gm. phenylethylbarbituric acid and 0.03 Gm. papaverine hydrochloride.—*Pharm. Presse*, 42 (1937), 201. (M. F. W. D.)

Nembutal Suppositories (Abbott Laboratory) contain in each, 2 gr. of nembutal in a cocoa butter base. It is a sedative, antispasmodic and hypnotic for rectal medication to prevent nausea or produce sedation and sleep when oral medication is undesirable. They are supplied in boxes of 12 and 100.—*Drug. Circ.*, 81, No. 6 (1937), 34. (E. V. S.)

Nutrachloric Tablets (Upjohn Company, Kalamazoo, Mich.) contain in each powdered milk 3.13 Gm., calcium carbonate 0.5 Gm. and sodium bicarbonate 0.15 Gm. Four tablets furnish a full dose of the most effective modification of the "Sippy Powders" and a buffer value in excess of the 90 cc. of milk-cream mixture specified in the original Sippy regime. They are indicated in the treatment of peptic ulcer and hyperacidity. Nutrachloric tablets are supplied in boxes of 48.—*Drug. Circ.*, 81, No. 6 (1937), 34. (E. V. S.)

Oxoids (Professional Drugs, Inc., New York) contain in each 5-gr. tablet specially prepared magnesium peroxide (25%) and magnesium oxide (75%). They are indicated in the treatment of gastric hyperacidity and peptic ulcer. The dose is one of four tablets three times daily with relation to food as directed by physician. Oxoids are marketed in bottles of 50 and 200.—*Drug. Circ.*, 81, No. 6 (1937), 34. (E. V. S.)

Panergon (Medizinischer Verstand G.m.b.H., Berlin) consists of a mixture of vitamins B_1, B_2, C and D, mineral salts and lecithin. It is supplied in tablet form and recommended as a nervine and blood tonic.—*Pharm. Zentralhalle*, 78 (1937), 417. (N. L.)

Phytossan (Behringwerke, Leverkusen a. Rh.) is a whooping-cough vaccine, intended for the prophylaxis and treatment of whooping-cough.—*Pharm. Zentralhalle*, 78 (1937), 417. (N. L.)

Procholon (E. R. Squibb & Sons) contains in each tablet $3^3/_4$ gr. of crystalline dehydrocholic acid, a complex oxidation product of cholic acid. It is a powerful cholagogue and a pronounced choleretic agent and indicated in the treatment of biliary stasis of any origin (except severe mechanical obstruction); liver poisoning (especially arsphenamine, phosphorus and cinchophen); liver insufficiency (cholangitis, cirrhosis, chronic passive congestion); cardiac conditions associated with biliary disease; cholecystitis, with or without cholelithiasis, provided no severe obstruction exists; intestinal stasis and chronic constipation due to or associated with inadequate secretion of bile. Procholon is supplied in bottles of 100.—*Drug. Circ.*, 81, No. 6 (1937), 35. (E. V. S.)

Sedorect (A. Bauer & Co., G.m.b.H., Berlin-Grunewald 1) is a hypnotic, sedative and anti-spasmodic suppository, containing chloral hydrate, extract of belladonna, codeine phosphate and antipyrine. It is supplied in packages of 5 suppositories.—*Pharm. Ztg.*, 82 (1937), 531. (N. L.)

Sepso (Linger-Werke, Dresden) is an antiseptic and parasiticide preparation marketed in the form of an ointment and alcoholic solution. It contains an iron brom-rhodan complex derivative and is suggested as a substitute for Tincture of Iodine and Ointment of Iodine.—*Pharm. Ztg.*, 82 (1937), 452. (N. L.)

Speick Soap (Walter Rau & Co., Möhringen-Stuttgart) contains the extracted principles of *Valeriana celtica* and other ingredients of animal and vegetable origin. The preparation is intended for external use, in order that the active ingredients may be absorbed into the body. It is recommended as a nervine.—*Pharm. Ztg.*, 82 (1937), 479. (N. L.)

Standartin Antitussicum (Chem. Fabrik Krewel-Leuffen G.m.b.H., Mettmann b. Düsseldorf) is a liquor containing the extracts of glechoma, grindelia, sanicula, castanea, thyme and symphytum; derivatives of benzoic acid, and volatile oil. It is recommended in the treatment of bronchitis, laryngitis, grippe and other respiratory infections.—*Pharm. Zentralhalle*, 78 (1937), 417. (N. L.)

Sulferrous (Chicago Pharmacal Co., Chicago) enteric-coated pills and contain in each, 3 grains of exsiccated ferrous sulfate. Four pills per day produce a daily increase in hemoglobin of 1% or more, and a corresponding rise in the erythrocyte count, this dosage produces a blood response difficult to obtain from eight to twelve times this quantity of iron in other forms, and is unusually well tolerated. Sulferrous is indicated in the treatment of secondary anemia. It is marketed in bottles of 100, 500 and 1000.—*Drug. Circ.*, 81, No. 6 (1937), 35. (E. V. S.)

Suppletan Ointment (C. F. Boehringer & Sohne, G.m.b.H., Mannheim-Waldhof) contains the lactation hormone 10 mg., perlatan 0.1 mg., cod liver oil 4.0 Gm., lanolin and vaseline, of each, a sufficient quantity to make 20 Gm. The ointment is recommended as a galactagogue, and it is intended for local application to the breast, with the consideration that the hormone is absorbed through the skin and thus exerts its action. The ointment is supplied in tubes of 20 Gm.—*Pharm. Ztg.*, 82 (1937), 570. (N. L.)

Thymodrosin Drops (Thymodrosin-G.m.b.H., Bad Godesberg a. Rh.) consists of 0.1 Gm. ephedrin and 25 Gm. thymodrosin purum. It is used as a cough remedy.—*Pharm. Zentralhalle*, 78 (1937), 417. (N. L.)

Thymodrosin Purum. (Thymodrosin-G.m.b.H., Bad Godesberg a. Rh.) consists of a mixture of the extracts of primula, viola, pimpinella, drosera, castanea, plantaginus, salix, saponaria, verbascum and thyme— the total representing 5 parts; sugar, 60 parts; distilled water, 35 parts; and aromatics. It is recommended for the treatment of coughs, grippe, catarrh, tuberculosis of the lungs, pneumonia, etc.—*Pharm. Zentralhalle*, 78 (1937), 418. (N. L.)

Valtheon Dragees (Firma Phaga, Vienna 17th dist.) contain 0.40 Gm. theobromine sodium valerate and are sold in packages of 20 and 50 tablets. **Valtheon-Quinine Dragees** contain in addition 0.10 Gm. quinine hydrochloride. **Valtheon-Caffeine Dragees** contain in addition 0.05 Gm. caffeine sodiobenzoate. **Valtheon-Digitalis Dragees** contain in addition 0.05 Gm. powdered digitalis. **Valtheon-Lithium Dragees** contain in each 0.40 Gm. theobromine sodium valerate-lithium. **Valtheon-Papaverine Dragees** contain 0.40 Gm. theobromine sodium valerate and 0.02 Gm. papaverine hydrochloride. **Valtheon Rhodan Dragees** contain 0.40 Gm. theobromine sodium valerate and 0.05 Gm. sodium thiocyanate. All are sold in packages of 20.—*Pharm. Presse*, 42 (1937), 238. (M. F. W. D.)

Valtheon Suppositories (Firma Phaga, Vienna 17th dist.) contain in each 0.40 Gm. theobromine sodium valerate in cocoa butter. **Valtheon-Caffeine Suppositories** contain in addition 0.05 Gm. caffeine sodiobenzoate. **Valtheon-Digitalis Suppositories** contain in addition 0.05 Gm. powdered digitalis leaves. **Valtheon Papaverine Suppositories** contain in addition 0.02 Gm. papaverine hydrochloride. All are sold in packages of 10 units.—*Pharm. Presse*, 42 (1937), 238. (M. F. W. D.)

Ventrosan Tablets (Eggochemia Co., Vienna, 19th dist.) are put up in packages of 20 and contain in each 0.15 Gm. colloidal aluminum oxide, 0.16 Gm. magnesium oxide, calcium carbonate and sodium bicarbonate.—*Pharm. Presse*, 42 (1937), 272. (M. F. W. D.)

Zyna Dragees (Dr. Wander, G.m.b.H., Vienna, 21st dist.) contain extract of *Cynarœ scolymi* and cucurma root, and are put up in packages of 60.—*Pharm. Presse*, 42 (1937), 239. (M. F. W. D.)

BACTERIOLOGY

Actinomycetes—Variations in, in Connection with the Theory of the Mycotic Nature of the Viruses of Tuberculosis and Leprosy. The author's concepts in a generalized and somewhat schematic manner are as follows: (1) There is no necessity to divide the group of "filamentous mycotic organisms" into streptothrices and actinomycetes. There exists only one large general

group, which may be designated either Actinomyces or Streptothrix. (2) Besides the cultures of these organisms that may be characterized as "typical," there exist in this group many variant forms that differ from the basic (typical) strain and from each other by their morphological, cultural and possibly biochemical properties. (3) In the development of such variant forms, outside of dissolution of the main trunk, an important part is evidently played by lysogenic substances that are formed as the culture ages. The action of these substances can be observed microscopically in fresh preparations in a change of refraction in the filaments; in stained slides the dissolving threads stain either very poorly or not at all. (4) Some of these variants are so "weak" and "unstable" that they become dissolved very soon after growth has started. This can be clearly observed in fluid media. However, even such extremely "degraded" variants can be reverted to the original, "typical" state by different methods. The process of "dissociation" is therefore a reversible phenomenon. (5) The formation of pigment being a very unstable and inconstant function, it cannot serve as a basis of differentiation in this group or in that of the acid-fast saprophytic diphtheroids. Therefore the designation of the old authors, as "*Actinomyces rosaceus, niger, violaceus, albidofuscus, polychromogenes,*" etc., must be discarded. (6) The filaments of the actinomycetes, under conditions the nature of which is not yet quite clear, have the ability to break up into rod-shaped elements that can be isolated as individual cultures. Whether or not this represents what is known as "cyclogeny" or "periodicity in the life status" cannot be stated from the writer's experience. (7) Isolated in pure culture, the rods exhibit properties characteristic of the diphtheroid microbes, from which they have received the name "diphtherideen" or "diphtheroids." (8) A close genetic relationship exists between the actinomycetes and the diphtheroids. (9) The fact that the bacilli of tuberculosis and leprosy, supposedly or actually deprived of their acid-fastness, reveal all of the characteristics of diphtheroid microbes, provides additional though indirect proof that tuberculosis and leprosy are diseases of mycotic origin. (10) Diphtheroids originating from a tuberculosis source can, by being cultured in milk, be transferred into acid-fast condition, and in that state they cause typical manifestations of tuberculosis in experimental animals. (11) An actinomycete isolated from a tuberculosis culture "dissociated" in the body of a rabbit into acid-fast rods that caused lesions typical of tuberculosis. (12) It is more probable that the Koch "bacilli" and the Hansen "bacilli" can change, while in the outside medium, into a more stable condition of a more highly differentiated, mycotic nature that stands nearer to the moulds. The epidemiologic significance of this phenomenon, for tuberculosis and especially for leprosy, must be considered very great.—W. I. KEDROWSKY. *Philippine J. Sci.*, 62 (1937), 439. (P. A. F.)

Air, Steam and Superheated Steam—Sterilizing Effects of Mixtures of. Sterilization appears to depend on the temperature of saturated steam and to be unaffected by the simultaneous presence of air. In other words there is no evidence that mixtures of air and steam are less effective than steam alone, provided that spores are exposed to saturated atmosphere and are really at the temperature they are thought to be, and provided that the method of removing the air is not such as itself to constitute a sterilizing process. Although a bacterial spore may retain the amount of water which it originally possessed when it is placed in superheated steam, efficient sterilization may depend on an increase of this water, or some water may be lost without serious effect. By means of a special apparatus devised by the author relative values of saturated and super saturated steam were determined on spores contained in earth. It was found that steam does not lose its sterilizing power as soon as any degree of superheating exists, but continues to be effective when superheated by 5° to 15° C. or more, depending on its initial temperature. Although superheating in moderate amounts is not necessarily serious, steam at low pressures cannot be made effective merely by raising its temperature to that of an effective variety of steam at higher pressure.—R. M. SAVAGE. *Pharm. J.*, 139 (1937), 155. (W. B. B.)

Chemotherapy—Researches in. Researches on bactericides and amœbicides are reviewed.—F. L. PYMAN. *Chemistry and Industry*, 56 (1937), 789; cf. *Pharm. J.*, 139 (1937), 274. (E. G. V.)

Disinfectants for Specific Purposes. The best known test for bactericidal efficiency is the Rideal-Walker test, which was first published in 1903. Several modifications have been introduced not only by the authors but by other workers. In 1934 the British Standards Institution published details of a standard Rideal-Walker test and this is now the standard for the buying and selling of disinfectants in Great Britain. The weaknesses of the Rideal-Walker test are pointed out. It is said that the R-W coefficient gives little information and, unless its exact meaning is

understood, may lead to a sense of false security. Three factors lend themselves to measurement in the testing of the bactericidal value of a disinfectant and must be carefully considered; these factors are the velocity constant, the concentration coefficient and the temperature coefficient. Because disinfectants differ in three independent ways, these three constants are required to indicate their relative efficiencies. Formulæ are given for the calculation of these three factors. Proper disinfection of the unbroken skin is of great importance to the surgeon, the midwife and all engaged in the handling of sterile material. In tests conducted to determine the effectiveness of certain disinfectants, complete elimination of skin diphtheroids and skin staphylococci was obtained by using: (*a*) crystal violet, 1 in 200 (thirty minutes), (*b*) brilliant green, 1 in 200 (thirty minutes), (*c*) lysol, 1 in 160 (five minutes), (*d*) chloramine T, 1 in 100 (three minutes), (*e*) aqueous iodine, 1 in 50 with, 3 to 4% potassium iodide (one minute), (*f*) dettol 30% paste (two minutes) and (*g*) undiluted dettol (one and one-half minutes). Iodine and dettol stand out clearly as efficient skin sterilizers, both with respect to rapidity and completeness of effects. One worker found that in the presence of blood the bactericidal value of iodine is reduced enormously. Iodine will kill streptococci in a few minutes at a dilution of 1 in 120,000 in distilled water, but the addition of 5% blood requires a concentration of 1 in 1000, and 50% blood 1 in 200 to prevent growth. Thus a distinction must be drawn between the use of iodine as a skin sterilizer and as an application to wounds. Lysol in the necessary concentration is apt to be irritating, and therein lies the danger that the operator may be tempted to dilute it out of its effective range. It is stated that the treatment for two minutes of rubber gloves (heavily infected with streptococci) by the following substances can be relied upon to give complete sterility as far as non-sporing organisms are concerned, even when these have been dried upon the surface of the gloves in a sticky medium such as pus and blood: (*a*) aqueous iodine, 1 in 50, with potassium iodide 4%, (*b*) dettol undiluted or 30% cream, (*c*) lysol, 1 in 50, and mercuric biniodide, 1 in 250. Acriflavine is one of the more popular wound disinfectants. One of the most popular preparations of acriflavine is Emulsio Acriflavinæ B. P. C. —H. BERRY. *Pharm. J.*, 139 (1937), 541, 571. (W. B. B.)

Dressings Enclosed in Drums—Note on the Penetration of Heat into. The author contends that the drums used in hospitals for containing dressings undergoing sterilization are hindrances to effective penetration, and act, as far as heat penetration is concerned, by converting the separate dressings into one large package. Penetration of heat into these drums takes place by a successive series of processes—direct flow of steam into the space at reduced pressure, followed by compression of the residual air, and finally in the inner parts, conduction, convection, radiation, as well as by heating by steam generated by these effects from the cotton itself. Holes in the drums play an important part, even in so-called vacuum sterilization. Penetration is not so certain as when dressings are in crates or bags, and the process is one which requires good control and adequate allowance for varying conditions if it is to be effective.—R. M. SAVAGE. *Pharm. J.*, 139 (1937), 154. (W. B. B.)

Escherichia Coli—Bactericidal Effect of Ultraviolet Radiation on, in Liquid Suspensions. Methods are described which make possible the observation of the lethal effects of ultraviolet radiation in dense liquid suspensions of *Escherichia coli*, and of determining the effects of sub-lethal doses as well. The energy required for inactivation of standard cultures is about twice that required for the inactivation of washed standard cultures. Data are given on the energies required for the inactivation of young (7-hour) cultures and washed and unwashed 10-day-old cultures. The young cultures have a higher energy of inactivation than the standard cultures, but the old cultures, washed or not, behave like the washed standard cultures. The formula from which these data are derived corrects for the protective action of non-viable organisms. The differences in the sensitivity of young, standard and old cells to radiation may be due: (*a*) to the greater number of double cells in the young cultures, and (*b*) to the large number of dead cells in the old cultures. The possible mechanism of the lethal action of ultraviolet radiation is discussed.—A. HOLLAENDER and W. D. CLAUS. *J. Gen. Physiol.*, 19 (1936), 753–765; through *Physiol. Abstr.*, 22 (1937), 733. (F. J. S.)

Garlic Vapor as a Bactericidal Agent. Tests with a crushed garlic on heavy bacterial suspensions, indicated substance in vapor to have high bactericidal index. Various volatile components of garlic tested; non-odorous allyl aldehyde (acrolein) proved to be antiseptic. Also relatively non-toxic for mammals.—CURRENT COMMENT. *J. Am. Med. Assoc.*, 108 (1937), 1657. (M. R. T.)

BOTANY

Cocos Nucifera—Chemical Examination of Water from. The coconuts analyzed were: (1) green nut without kernel, (2) green nut with soft kernel, (3) green nut with semi-hard kernel, (4) brownish green nut with hard kernel. The quantity of water decreases and the p_H increases with the growth of the fruit. In 2 and 3 the water is richest in sugar and also in ascorbic acid. The salt concentration is least in 2 and only slightly greater in 3.—S. K. GANGULI. *Science and Culture*, 2 (1936), 224–225; through *Chem. Abstr.*, 31 (1937), 4694. (F. J. S.)

Fungi—Sterols and Carbohydrates in. I. Boletus Edulis. The sterols of this fungus consist mainly of ergosterol, together with small quantities of a sterol closely resembling spinasterol. Trehalose was the chief crystallizable carbohydrate isolated.—A. RATCLIFFE. *Biochem. J.*, 31 (1937), 240–243; through *Physiol. Abstr.*, 22 (1937), 744. (F. J. S.)

Leptactina Senegambica. The plant *Leptactina senegambica* Hook (*Rubiaceæ*) was originally believed to be a species of jasmin. The odor of Karo-Karounde (an extract from the plant) is floral and slightly balsamic and fruity. The decolorized product has an odor quite different from the untreated product, being reminiscent of sweet violets.—H. S. REDGROVE. *Mfg. Perfumer*, 1 (1936), 27; through *Am. Perfumer*, 34 (1937), 68. (G. W. F.)

Living Cell—p_H of. A discussion.—JOSEF SPEK. *Ergebnisse Enzymforsch.*, 6 (1937), 1–22; through *Chem. Abstr.*, 31 (1937), 6261. (F. J. S.)

Plant-Growth Hormones—Synthetic. β-Thionaphthene acetic acid was synthesized as follows: thionaphthene → β → bromothionaphthene → β → thionaphthene carboxylic acid chloride → β-thionaphtheneacetic acid (I) by use of the reaction of Arndt and Eisert (*C. A.*, 29, 3323). (I) melts at 109° and has a much smaller growth activity than β-indole acetic acid. Isomeric (I) has about the same activity as (I) toward peas but is without effect on oats. α-Naphthalene acetic acid is several times more powerful than (I) as shown by both oat bending and pea tests.—ERICK M. CROOK, WM. DAVIES and NORMA ELIZABETH SMITH. *Nature*, 139 (1937), 154–155; through *Chem. Abstr.*, 31 (1937), 4698. (F. J. S.)

Plant Growth-Promoting Substances—Preparation of. I. l-Naphthaleneglyoxalic Ethyl Ester; l-Naphthaleneglycollic Acid; l-Naphthaleneacetic Acid. Methods of preparation of *l*-naphthaleneacetic acid are briefly reviewed, and their advantages and disadvantages are discussed. The acid was prepared by the reaction of naphthalene with chloroglyoxalic ethyl ester in the presence of anhydrous aluminum chloride, leading to *l*-naphthaleneglyoxalic ethyl ester in 50% yield. The latter on reduction with sodium amalgam furnished *l*-naphthaleneglycollic acid, and with hydriodic acid and red phosphorus, *l*-naphthaleneacetic acid. The crystallographic properties of *l*-naphthaleneacetic acid are described and its solubility in water at 25° C. is found to be 41–42 mg. per 100 cc.—F. WILCOXON. *Contrib. Boyce Thompson Inst.*, 8 (1937), 467–472; through *Physiol. Abstr.*, 22 (1937), 741. (F. J. S.)

"Protoplasma"—More about the Word. A discussion of the term with thirty-four references.—F. K. STUDNICKA. *Protoplasma*, 27 (1937), 619–625; through *Chem. Abstr.*, 31 (1937), 6262. (F. J. S.)

Sandalwood Regeneration and Propagation. Sandal is a profilic seed-bearer. It reproduces itself plentifully from seed and also to a certain extent by root-suckers and coppicing. Artificial methods of propagation are: (1) Sowing *in situ*. (2) Raising plants in the nursery and then transplanting them. (3) Raising plants in the nursery and stump-planting them. (4) Root-suckers and root-planting. Each of these methods is described in detail.—ANON. *Perfumery Essent. Oil Record*, 28 (1937), 338. (A. C. DeD.)

CHEMISTRY

GENERAL AND PHYSICAL

Borax as an Acidimetric Standard. II. Borax may be kept indefinitely over a saturated sugar-salt solution without any change in composition. Dry, recrystallized borax may be stored in tightly stoppered bottles for as long as a year without undergoing any change in composition greater than 0.1 per cent. Borax is superior to sodium carbonate as an acidimetric standard for general use, since it is equally accurate, more precise, faster and more convenient.—FRANK H. HURLEY, JR. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 237. (E. G. V.)

Dusts, Smokes and Other Dispersions—Instrument for Both Counting and Weighing Particles of. The meter described utilizes, as a reception record for counting, a transparent film

which can remain attached to the normal record disc for counting, and can be easily removed for weighing.—S. C. BLACKTIN. *J. Soc. Chem. Ind.*, 56 (1937), 281T. (E. G. V.)

Electrical Heating Apparatus—Simple and Inexpensive. An apparatus which is peculiarly adapted to the heating of volatile solvents for reflux or distillation consists of an ordinary flower pot with an upper diameter of about 15 cm. and a base of about 9 cm. The hole in the bottom is enlarged (with a rat-tailed file) to accommodate a carbon filament electric bulb. A set of rings from the ordinary copper water-bath is placed on the pot. The whole apparatus is used in a ring stand or tripod support. The device reduces the danger of solvent inflammability, is free from water vapors which may injure a sensitive reaction, and so illuminates the flask contents as to make observation easy. It successfully refluxes quantities of ether up to 400 to 500 cc.; with higher boiling solvents (benzene, ethyl alcohol) volumes of about 100 cc. can be distilled off, if a towel or asbestos paper is wrapped around the flask for insulation. The output can be varied by substituting a low-wattage tungsten-filament bulb or a heating unit with standard lamp socket thread, such as is used in electric heaters of the reflector type.—FRITZ BREUER. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 363. (E. G. V.)

Gas Scouts—Selection and Training for. Considerable is being written in foreign pharmaceutical journals on chemical warfare. The art of gas detection and scouting has been one of the outgrowths of the impending danger of gas attacks. The detection of gases is classified into two series (*a*) according to sensitivity of odor and (*b*) according to identification and differentiation of odors. A bibliography is given.—D. H. WESTER. *Pharm. Weekblad*, 74 (1937), 363 and 476. (E. H. W.)

Glass Electrode—Errors of. It has been found that at temperatures above 30° C. the glass electrode is not in agreement with the hydrogen electrode, exhibiting deviations not only in the alkaline but also in the neutral acid ranges. The magnitude of these deviations is greatly influenced by temperature changes and by the sodium-ion concentration. These departures are entirely reproducible, however, and correction curves have been furnished for use with two commercial types of glass electrode. The theory of these errors is briefly reviewed.—W. C. GARDINER and H. L. SANDERS. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 274. (E. G. V.)

Glass Electrodes—Low Resistance. Procedure for making a low-resistance glass electrode (of Corning 015 glass) is given. Electrodes made in this manner are fully as satisfactory as the traditional types, with the additional advantage that the measurements may be made with the ordinary potentiometer and a portable galvanometer of medium sensitivity. The electrical resistance ranges from 10^4 to 10^5 ohms.—H. MOUQUIN and L. GARMAN. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 287. (E. G. V.)

Molecular Distillation—Apparatus and Methods. Details of construction, use and performance are given.—K. C. D. HICKMAN. *Ind. and Eng. Chem.*, 29 (1937), 968. (E. G. V.)

Particle-Size Distribution—Measurement of, by Optical Methods. A brief study was made of the effect of light of different wave-lengths upon the turbidity-concentration relation of aqueous suspensions of white and colored mineral powders using the Wagner turbidimeter. It was found that yellow and red light gave about the same slope as white light for a plot of concentration against turbidity, but that green light yielded a curve that diverged from white light in the region of low concentration. This indicates that the suspensions tend to absorb the shorter wavelengths, thereby affecting the output of the photoelectric cell with an attendant influence on the particle-size distribution as measured by this method.—H. E. SCHWEYER. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 211. (E. G. V.)

Protein Dialysis—a Rapid Method for. Electrodialysis of protein solutions containing high concentrations of ammonium sulfate may result in acid denaturation due to accumulation of sulfuric acid in the protein solution. An apparatus has been designed to decrease the time necessary for complete removal of salts from the protein solutions. The protein solution is first dialyzed until the salt concentration is low, and the remaining ions are removed by electrodialysis. Sketches of the simple dialyzer and electrodialyzer are given.—F. W. BERNHART, L. E. ARNOW and A. C. BRATTON. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 387. (E. G. V.)

Symbols of Thermodynamical and Physico-Chemical Quantities and Conventions Relating to Their Use. Some 106 symbols and abbreviations, as well as other subscripts and modifying signs, are listed, as recommended by the joint committee of the Chemical Society, Faraday Society and Physical Society.—*Chemistry and Industry*, 56 (1937), 860. (E. G. V.)

Useful Vacuity. The art of molecular distillation is described, and applications in the field of vitamin research are discussed.—D. H. KILLEFFER. *Ind. Eng. Chem.*, 29 (1937), 966. (E. G. V.)

INORGANIC

Bismuth—New Reagent for. A mixture of a 1% solution of 2-methyl benzothiazole in 95% alcohol and 1*M* potassium iodide is a sensitive reagent for bismuth and antimony. Bismuth may be detected in the presence of antimony and all the other cations encountered in the usual qualitative analysis scheme by the deep red-orange color of the bismuth precipitate, while antimony alone gives a yellow precipitate. Copper and ferric ions interfere, due to the formation of free iodine, but the interference is eliminated by the addition of sodium bisulfite. Mercuric ion forms a yellow precipitate with 2-methyl benzothiazole alone.—BARNET NAIMAN. *J. Chem. Educ.*, 14 (1937), 484. (E. G. V.)

Hydrochloric Acid. This paper is one of a series discussing the pure mineral substances of the Belgian Pharmacopœia. The discussion embraces the following divisions: title; synonyms; formula; molecular weight; history; foreign pharmacopœias; manufacture; physical properties; chemical properties; investigation; quality; use.—V. EVRARD and A. DE SWEEMER. *Pharm. Tijdschrift*, 14 (1936), 121. (E. H. W.)

Phosphoric Acid—Concentration of. Considerations governing the correct conditions and apparatus for concentrating orthophosphoric acid are discussed.—B. MOORE and T. H. BARTON. *J. Soc. Chem. Ind.*, 56 (1937), 273T. (E. G. V.)

Strontium and Calcium—Micro-method for Determination of, in Mixtures Containing Both. A quantitative method is described for the estimation of small amounts of strontium and calcium in mixtures containing both. Both substances are precipitated as oxalates in 20% alcohol. The oxalates are converted to the carbonates or oxides by heating, and these are titrated acidimetrically. The solution, after this titration, is treated with a mixture of oxalate and sulfate at p_H 3.0. Calcium is precipitated as the oxalate, the strontium as the sulfate. The calcium oxalate is then converted to the carbonate or oxide and titrated acidimetrically. The difference between the first and the second titration represents the strontium in equivalents and the second titration represents the calcium in equivalents. This method may be applied directly to serum.—A. E. SOBEL, A. PEARL, E. GERCHICK and B. KRAMER. *J. Biol. Chem.*, 118 (1937), 47–59; through *Physiol. Abstr.*, 22 (1937), 569. (F. J. S.)

Strontium Nitrate—Refractive Index of. The refractive index of strontium nitrate, used as a known in determining the refractive indices of solids by immersion methods, is often given an erroneous value in literature. The correct value is 1.5878.—M. L. YAKOWITZ and P. S. JORJENSEN. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 204. (E. G. V.)

ORGANIC

Alkaloids

Curare—South American. The bark stem of Macoubea in the dry form is a brown, friable, slightly adhesive mass containing a certain amount of fruit pericarp. There was extracted 4.85% of a crystalline alkaloid, macoubeine, $C_{22}H_{25}N_2O_2.4H_2O$. It gives a strongly basic, fluorescent aqueous solution. Its specific rotatory power in alcohol at 0° C. is −55.5°. When heated slowly it sublimes at 195° C. It forms well-crystallized salts with elimination of water. On shaking a crystal with dilute sodium hydroxide, there is formed a bright pink color turning ponceau red. On pouring an ether solution of the alkaloid over a sulfuric acid solution of potassium dichromate, a deep green ring is formed. The pharmacological action of the alkaloid was studied on cold- and on warm-blooded animals. In all cases the characteristic phenomena were the same but occurred after varying lengths of time. After injection there is a short period of excitation followed by progressive paralysis of the muscular system and slowing of the respiration. This is followed by increasingly strong convulsions; death can occur through inflammation of the kidneys. The compound exerts a very favorable action in the treatment of tetanus, but no experiments seem to have been made on man as yet.—F. W. FREISE. *Pharm. Ztg.*, 81 (1936), 818–820; through *Chimie & Industrie*, 38 (1937), 104. (A. P.-C.)

Cytisine—Synthesis of Local Anesthetics from. Cytisine and ethylene oxide react on heating with chloroform under pressure for five hours at 45° C. to give pale yellow crystals of *N*-β-hydroxyethylcytisine containing one molecule of water, m. p. 73° to 74° C. The anhydrous alcohol, which did not crystallize, refluxed with benzoyl chloride for three hours followed by treatment with hydrobromic acid (12%) gives β-cytisinoethylbenzoate hydrobromide, m. p. 247° to 248° C. with decomposition; the cinnamate hydrobromide, m. p. 246° to 247° C. with decomposition, was also prepared. The γ-chloropropylbenzoate refluxed with sodium iodide in acetone for half an hour, treated with cytisine and again refluxed for four hours, gives γ-cytisinopropylbenzoate hydrobromide, m. p. 232° to 233° C. with decomposition; from the appropriate γ-chloropropyl esters the following were also prepared: cinnamate hydrobromide, m. p. 224° to 225° C. with decomposition; phenylcarbamate hydrobromide, m. p. 225° to 226° C. with decomposition; γ-cytisinopropyl-α-naphthylcarbamate, m. p. 159° C.; hydrobromide, m. p. 237° to 238° C.; γ-cytisinopropyl-*p*-nitrobenzoate hydrobromide, m. p. 255° to 256° C. and the *p*-aminobenzoate hydrobromide, m. p. 236° to 237° C. with decomposition. Cytisine and β-chloroethyl-*p*-nitrobenzoate give β-cytisinoethyl-*p*-nitrobenzoate, m. p. 103° to 104° C.; hydrobromide, m. p. 232° to 233° C. All of these compounds, except the *p*-aminobenzoate, show pronounced local anesthetic activity, and they are all less toxic than cocaine, with the exception of the phenylcarbamate. The introduction of an alkyl ester group into cytisine appears to remove entirely the characteristic pharmacological properties of the alkaloid.—H. R. Ing and R. P. Patel. *J. Chem. Soc. Lond.* (1936), 1774; through *Quart. J. Pharm. Pharmacol.*, 10 (1937), 222, 223. (S. W. G.)

Ergot—Estimation of the Alkaloidal Content of. Methods for the estimation of the alkaloids and the preparation of standard solutions are discussed.—F. G. Otten. *Pharm. Weekblad*, 74 (1937), 511. (E. H. W.)

Evodin. The author reviews the investigations of Evodia species and describes results of an examination of the fruits of *E. Danielli* Hansl. (*Rutaceæ*). The author showed the identity of the evodin from *E. Danielli* and *E. rutæcarpa*. The dried fruits obtained from Manchuria were percolated with acetone at ordinary temperature. After most of the solvent has been removed from this extract a wax-like substance separates. Complete evaporation of the solvent from the wax-free solution causes separation into two layers, the lower contains the evodin. Steam distillation of the latter yields a volatile oil in which limonene is present (bromide, m. p. 99°). The crude evodin was dissolved in chloroform and extracted with aqueous potassium hydroxide solution The evodin remained in the chloroform whereas a phenol, evadol, was taken up by the alkali from which it was recovered by acidification: m. p. 281°, soluble in acetone, chloroform, slightly soluble in ethanol, benzene, insoluble in petroleum ether and ether. Diazomethane formed a methyl ether of evodol, m. p. 279° from alcohol.—S. Mayedà. *J. Pharm. Soc. Japan*, 55 (1935), 90–94. (R. E. K.)

Evodin—Identity of, with Obakulactone and Dictammolactone. In 1902 Keimatsu isolated a crystalline substance $C_{18}H_{22}O_6$ from the fruits of *Evodia rutæcarpa* B.H. which was called evodin. Similar substances have been isolated from a number of species of the Rutaceæ. A careful comparison of two of these, obakulactone and dictammolactone, with evodin have shown their complete identity as shown by the accompanying table. The identity was further confirmed by mixed melting point observations.

	Decomposition.	$[\alpha]_D$ in Acetone.	$[\alpha]_D$ in N/2 Alkali.
Evodin (Asahina)	292–293°	−123.4°	+30.8°
Evodin (Fujita)	292–293°	−118.6°	+30.1°
Obakulactone (Fujita)	292–293°	−119.17°	.....
Obakulactone (Kaku and Kutani)	292–293°	−122.5°	+29°
Dictammolactone (Kaku and Kutani)	292–293°	−123.7°	+31.3°

Atsushi Fujita, Tenmin Kaku, Noboru Kotani. *J. Pharm. Soc. Japan*, 55 (1935), 67–70. (R. E. K.)

Hyoscyamine—Synthesis of, in Belladonna. Experiments have been carried out on *Atropa belladonna* in the attempt to elucidate the mechanism of alkaloid synthesis. Plants were grown in sand and the effects of withdrawal of essential elements examined. The samples were assayed for hyoscyamine by freezing in solid carbon dioxide, thawing, expressing the sap and extracting the

residue with $N/20$ sulfuric acid. The alkaloids were extracted after adding ammonia and a micro-Kjeldahl determination carried out on the extract. Withdrawal of potassium was without effect on the alkaloid content of the plant. Nitrogen starvation quickly checked the growth of plants but alkaloid formation continued. Plants grew well with asparagine, hexamine and ammonium sulfate as the sole source of nitrogen and the alkaloid content rose. Calcium and potassium nitrates and urea also produced good growth but caused little or no alteration in the alkaloid content. Potassium nitrate and glucose caused increased production in plants grown in darkness. Detached leaves kept in the dark with their petioles immersed in glucose solution showed increase in alkaloid content, but potassium nitrate instead of glucose only caused a rise if a reserve of carbohydrate was present. Detached leaves in darkness with their petioles in distilled water also showed increase in alkaloid content provided that carbohydrate reserves were present. These experiments suggest that the alkaloid molecule is built up from products of protein breakdown and carbohydrate intermediates.—B. T. CROMWELL. *Biochem. J.*, 31 (1937), 551; through *Quart. J. Pharm. Pharmacol.*, 10 (1937), 223. (S. W. G.)

"Kuh-Seng"—an Alkaloid from the Chinese Drug. A new alkaloid was isolated from the fresh root of *Sophora flavescens* Ait., gathered near Tokyo. It dissolves with greater difficulty in ether than does the alkaloid matrine, previously isolated from the drug, and can be easily separated therefrom. It separates from anhydrous acetone in the form of prisms, m. p. 208° C. and from hydrous acetone in the form of needles, m. p. 77–80° C. Both types of crystals are very soluble in water with a strongly alkaline reaction. The former has a specific rotation, $[\alpha]_D^8 = +29.8°$, and has the formula $C_{15}H_{24}N_2O_2 + H_2O$. The single molecule of water of crystallization could not be separated by heating in a vacuum, though its presence was ascertained by analysis of its derivatives. The latter has the formula $C_{15}H_{24}N_2O_2 + xH_2O$. Both forms gave a picrate, $C_{15}H_{24}N_2O_2.C_6H_3N_3O_7$, in the form of leaflets decomposing at 215° C., a prismatic gold double salt, $C_{15}H_{24}N_2O_2.HAuCl_4$ decomposing at 207° C., and a leaf-shaped platinum double salt, $C_{15}H_{24}N_2O_2.H_2PtCl_6$ decomposing at 250° C. One of the nitrogen atoms is definitely of a tertiary nature and the other is probably a lactim nitrogen, as in matrine, lupanine and hydroxylupanine. Although its relationship to matrine has not been established, we have tentatively given the new alkaloid the name hydroxymatrine.—HEISABURO KONDO, EIJI OCHIAI and KYOSUKE TSUDA. *Arch. Pharm.*, 275 (1937), 493. (L. L. M.)

Menisarin—Constitution of. The absorption curve of menisarin resembles that of trilobin as menisarin and hydromenisarin also give a blue color with HNO_3-H_2SO_4 which is characteristic of the diphenylene-dioxide nucleus. Reduced with zinc dust and acetic acid menisarin forms dihydromenisarin: $C_{36}H_{36}N_2O_6$; colorless micro-platelets, m. p. 164°; $[\alpha]_D^{15} + 265°$ in chloroform; positive Liebermann nitroso-reaction; *N*-methyl-di-methiodide, decomposing at 265°. The formation of the latter proved that dihydromenisarin is a tertiary-secondary base and that menisarin contained a *N*-methyl-tetrahydroisoquinolin ring and a dihydroisoquinolin ring with a tertiary nitrogen atom. The structure is thought to be analogous to that of hormalin. Potassium permanganate oxidation of dihydromenisarin gave 6-methoxy-diphenylether-3,4′-dicarboxyl, m. p. 305°, which is identical with the acid from trilobin and oxyacanthin. Dimethyl sulfate and alkali followed by boiling 25% potassium hydroxide converted dihydromenisarin into the colorless *N*-methyl-methyl-methine: $C_{39}H_{42}N_2O_6$, m. p. 112°; $[\alpha] \pm 0°$; 3-OCH_3 groups (Zeisel). Phenol groups were not indicated by either dimethylsulfate or diazomethane. The optically inactive methin base was ozonized in acetic acid. It yielded fragments analogous to those from trilobin: (1) 6-methoxy-diphenylether-3,4′-dialdehyde, m. p. 75°; disemicarbazone, decomposing at 230°. (2) An aldehyde-acid, m. p. 220–70°. (3) A water-soluble amino-aldehyde; dimethiodide, m. p. 224°, reacted with 5% potassium hydroxide to give $(CH_3)_3N$ and a "vinyl aldehyde" $C_{20}H_{16}O_6$, m. p. < 300°. It was concluded that the bis-isoquinolin portion of the menisarin molecule is constituted like that of trilobin, except that it contains one more methoxy group and a dihydro- instead of a *N*-methyl-tetrahydro-isoquinolin nucleus.—M. TOMITA and H. KONDO. *J. Pharm. Soc. Japan*, 55 (1935), 100–103. (R. E. K.)

Morphine—Extraction of Minute Amounts of. To three 10-cc. portions of water were added, respectively, 250 gamma of morphine (as sulfate), 250 gamma of morphine (as sulfate) and 0.1 Gm. of pyrogallol, and 0.1 Gm. of pyrogallol. Each solution was analyzed as follows: Sufficient dilute sodium hydroxide was added to make the solution distinctly alkaline to litmus. It was then extracted three times with equal volumes of ether, and the ether extracts were combined and washed

three times with 2-cc. portions of water containing 10 drops of 20% sodium hydroxide solution in each 100 cc. The ether was then dried with anhydrous sodium sulfate and evaporated. The residue from evaporation was dissolved in a small amount of slightly acidified water and drops of the solution were tested with various alkaloidal precipitants and color reagents with negative results. The alkaline aqueous solution remaining after the extraction with ether was neutralized with dilute hydrochloric acid, made alkaline with ammonium hydroxide, and after addition of 1 cc. alcohol, extracted three times with equal volumes of hot chloroform-alcohol mixture (9 plus 1). The extracts were combined and washed three times with 2-cc. portions of ammoniacal water-alcohol mixture (75 cc. of water, 25 cc. of alcohol, 10 drops of ammonium hydroxide). The extract was then dried with anhydrous sodium sulfate and evaporated. The residue from evaporation was dissolved in a small amount of slightly acidified water and tested for morphine with alkaloidal precipitants and color reagents. Strongly positive tests were obtained with the residue from the morphine-pyrogallol solution, weakly positive tests with the residue from the morphine solution without pyrogallol, and negative tests with the residue from the solution containing only pyrogallol.—CHARLES E. MORGAN. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 383. (E. G. V.)

Senecio Alkaloids. *Senecio viscosus* and *S. squalidus* yield, in much greater amount than *S. vulgaris*, a crystalline alkaloid senecionine, $C_{11}H_{25}O_5N$, m. p. 242° C. $[\alpha]_D$, −55.6°, now obtained pure for the first time, which gives on hydrolysis a base, retronecine, m. p. 118° C. $[\alpha_D]$, +52.1° to +52.2°, and a new unsaturated lactonic acid, $C_{11}H_{14}O_4$, named senecic acid, crystallizing in needles from dry ether, m. p. 153° C., $[\alpha]_D$, +41.8°; the lactone group is very stable and not readily reformed after hydrolysis. Hydrogenation of senecic acid gives dihydrosenecic acid, m. p. 106° C. *S. squalidus* also yields a minute quantity of a bitter crystalline alkaloid, squalidine, $C_{18}H_{25}O_5N$, isomeric with senecionine, m. p. 169° C. $[\alpha]_D^{16}$° C., −26.9°; nitrate m. p. 204° C., $[\alpha]_D^{16}$° C., −8.65; picrate, m. p. 203° C. On hydrolysis, it yields a base, m. p. 115° C., almost certainly retronecine, and squalinecic acid, m. p. 129° C.—G. BARGER and J. J. BLACKIE. *J. Chem. Soc., Lond.* (1936), 743; through *Quart. J. Pharm. Pharmacol.*, 10 (1937), 225. (S. W. G.)

Strychnine and Phenols—Solubility Products of. Strychnine forms a number of phenol derivatives which are comparatively insoluble. Their formation agrees with the law of mass action and occurs even with pharmacologically active quantities. The picric acid determination of alkaloids is an example of the phenol-alkaloid reaction.—R. LABES and FU-HUA-LÜ. *Biochem. Z.*, 286 (1936), 232–247; through *Physiol. Abstr.*, 22 (1937), 573. (F. J. S.)

Trilobamin—Constitution of. Oxidation of trilobamin, and other reactions, indicated that this alkaloid belonged to the oxyacanthin type. But a comparison of dimethyltrilobamin and monomethyl-berberamine proved them to be quite different. A crystalline α-methine, m. p. 152°, recently obtained from dimethyltrilobamin indicated identity with monomethyloxyacanthin. Their identity was further confirmed by the following tabulation:

	Dimethyltrilobamin.	Monomethyloxyacanthin.
Composition	$C_{38}H_{42}N_2O_6$	$C_{38}H_{42}N_2O_6$
Crystal form.	Amorphous	Amorphous
Specific rotation	$[\alpha]_D^6$ = +300.3° ($CHCl_3$)	$[\alpha]_D^8$ = +289.1° ($CHCl_3$)
Hydrochloride	Decomposing at 271° (needles)	Decomposing at 271° (needles)
Methiodide	Decomposing at 255–260° (crystals)	Decomposing at 255–260° (crystals)
α-Methin	M. p. 152° rosettes	M. p. 152° rosettes
Des-base	M. p. 217–218° crystals	M. p. 243° crystals (?)

It is strange that v. Bruchausen obtained a "des-base," m. p. 243°, from methyl-oxyacanthin (*Arch.*, 267, 624). However, a consideration of the mechanism by which water is lost in the Hoffmann dissection of trilobin and cepharanthin indicates that the formation of several des-*N*-methyl-bases is possible. Diethyltrilobamin-ethiodide (from trilobamin, ethyliodide and alkali) was subjected to the Hoffmann reaction and then to potassium permanganate oxidation. The formation of 6-ethoxy-diphenylether-3,4′-dicarboxylic acid proved that one of the two free hydroxyls in trilobamin occupies position 6.—M. TOMITA and H. KONDO. *J. Pharm. Soc. Japan.*, 55 (1935), 104–106. (R. E. K.)

Veratrum Album—Alkaloids of. A new alkaloid, $C_{36}NH_{57}O_{11}N.H_2O$, was found and called *Germerin* (A). (A) treated with alocholic potassium hydroxide yields a crystalline base, $C_{26}H_{41}$-

O_8N, called germin (B), two acids, lævomethylethylacetic acid (C) and methylethylglycollic acid (D). Protoveratridin (E) by the same treatment is converted into (B) and (C); (A) upon treatment with a solution of barium hydroxide is converted into (E) and (D). These reactions indicate that (A) is the methylethylglycollic acid ester of (E) which is the methylethylacetic ester of (B). Proveratrin (F), $C_{40}H_{63}O_{14}N$, upon treatment with alcoholic potassium hydroxide gives acetic acid, (C) and (D). Jervin, pseudojervin and rubijervin, three other alkaloids of the herb, are not ester alkaloids since they do not hydrolyze with alcoholic potassium hydroxide.—W. POETHKE. *Pharm. Monatsh.*, 18 (1937), 77. (H. M. B.)

Essential Oils and Related Products

Essential Oils—Examination of Esters of. It is proposed to apply Duclaux's method, which is used for the examination of the volatile acids in wines, to the examination of volatile oils. This method can be used for the identification of the oils, the determination of their purity and the characterization of the esters present. The method consists in submitting the free and combined acids to steam distillation under defined conditions. Equal and successive fractions of the distillate are collected and the acidity of each determined. Then the ratios of the volatile acids, collected in the successive fractions, to the total volatile acids distilled are determined and the ratios to the total volatile and fixed acids. These ratios are characteristic of the oil examined and serve as a means of ascertaining the esters present.—B. ANGLA. *Ann. Chim. Anal.*, 18 (1936), 145; through *Quart. J. Pharm. Pharmacol.*, 10 (1937), 230. (S. W. G.)

Terpeneless Oils. Terpeneless oils may be obtained by fractional distillation. These oils have the advantage of being more soluble, less irritating to the skin, and possess a "softer" odor. They are not quantitatively stronger in odor than the original oil, since terpenes themselves possess some odor.—H. S. REDGROVE. *Am. Perfumer*, 34 (1937), 65–66. (G. W. F.)

Volatile Oils—Little Known. VI. Verbena Oil. The genuine oil is obtained by steam distillation of *Lippia citriodora* with a yield of 0.1% and has a very fresh, full aromatic citron odor and contains citral, limonene, geraniol, heptenone, citronellal and a ketone, vervenon. Examination of four commercial samples showed the color to vary from dark to bright yellow, d_{20} 0.882–0.995 and $[\alpha]_{D20}$ −9.79° to + 10°. The oil is of value in cologne waters and violet and red-rose perfumes.—E. TESTA. *Riechstoff-Ind. Kosmetik*, 12 (1937), 120. (H. M. B.)

Glycosides, Ferments and Carbohydrates

Cellulose—Structure of. Our present knowledge of cellulose is an outstanding example not only of international coöperation in science, but also of the effective coöperation of the various departments of science, including chemistry, physics, botany and microscopy. The atomic arrangement of carbon, hydrogen and oxygen in cellulose as β-glucosidic rings joined together by primary chemical valences to form long molecular chains has been well established and is widely accepted because it is supported by both chemical and physical experimental evidence, including analysis and synthesis, quantitative reactions such as esterifaction and etherifaction, and the physical evidence of optical birefringence and X-ray diffraction patterns.—HAROLD DEWITT SMITH. *Ind. Eng. Chem.*, 29 (1937), 1081. (E. G. V.)

Dehydrogenases—Action of Cyanide and Pyrophosphate on. The only dehydrogenase to be inactivated on incubation with cyanide is the xanthine dehydrogenase. Succinic dehydrogenase is the only one to be inactivated by pyrophosphate. As inhibition of respiration by pyrophosphate is marked, the theory that succinic dehydrogenase plays an important part in tissue respiration is supported.—L. F. LELOIR and M. DIXON. *Enzymologia*, 2 (1937), 81–88; through *Physiol. Abstr.*, 22 (1937), 591. (F. J. S.)

Enzyme Formation in Bacteria. Glucose, when present in the nutritional medium, stimulates the formation of urease, but suppresses that of catalase in *M. lysodeikticus*. The formation of urease and fumarase is not stimulated by the addition of their substrates to the medium. It is therefore concluded that the classification of adaptive and constitutive enzymes in bacteria is inadequate.—J. H. QUASTEL. *Enzymologia*, 2 (1937), 37–42; through *Physiol. Abstr.*, 22 (1937), 584. (F. J. S.)

Enzymic Ester Syntheses. In the presence of dry pancreatic esterase, the butyl esters of succinic, phthalic, glutaric, lactic and salicylic acids were prepared from solutions of the acid and

alcohol in non-aqueous solvents.—E. A. SYM and W. SWIATKOWSKA. *Enzymologia*, 2 (1937), 79–80; through *Physiol. Abstr.*, 22 (1937), 584. (F. J. S.)

Esterase—Specificity of a "synthesized." A review.—E. BAMANN. *Pharm. Monatsh.*, 18 (1937), 78. (H. M. B.)

Gluconic Acid Production. A study of the effect of air flow, agitation and air pressure on the production of gluconic acid from glucose by submerged mould growths in rotary aluminum drum fermenters has revealed that the fermentation rate is, to a large extent, dependent on the proper adjustment of these factors. Under the best conditions found, using 15% glucose solutions, yields of gluconic acid in excess of 84% based on the glucose available and 97% based on the glucose consumed, were obtained in 18 hours from the time of inoculation with germinated spores of *Aspergillus niger*. The fermentations were carried out in a type of vessel which, it is anticipated, can be easily adapted to large-scale operation.—P. A. WELLS, A. J. MOYER, J. J. STUBBS, H. T. HERRICK and O. E. MAY. *Ind. Eng. Chem.*, 29 (1937), 653. (E. G. V.)

Glycosides—Behavior of, on Sublimation. No direct conclusions regarding sublimability should be made from the fact that glycosides afford crystalline sublimates. It is far more important to identify the crystals obtained by their micromelting points and by other suitable reactions, because in many cases the microsublimates consist not of the intact glucosides but of their genins. If the melting point of the aglycon lies near or above the indefinite melting point (decomposition temperature) of the glycoside, it is probable that by heating the glycoside a sublimate consisting of the aglycon has been obtained. If one is sure that such a glycoside exists, the addition of acid to the sublimation mixture is expedient as thereby the aglycon is set free and sublimes more readily. Few glycosides can be heated beyond their melting points without decomposition. Only with those that can, is sublimation possible without decomposition; in any case, if crystallization is possible, the ability of the intact glycoside to crystallize or to sublime is essentially less than that of the aglycon. In the investigation, the apparatus described by Fischer (*Mikrochemie*, 10 (1932), 409) was employed. Micromelting point determinations were made after the manner of Kofler (*Mikrochemie*, 9 (1930), 38; 15 (1934), 242). This technic was used to characterize the following glycosides, many of which were obtained from pulverized botanical drugs: æsculin, fraxin, daphnin, phlorrhizin, quercitrin, baptisin, arbutin, solanin, digitonin, saponin, syringin and salicin. Photomicrographs of æsculetin, fraxetin, daphnetin, saligenin, solanidin and its hydrochloride are included. The melting points, sublimation points *in vacuo* and the melting points of the aglycons of the following are tabulated: æsculin, fraxin, daphnin, phlorrhizin, quercitrin, baptisin, solanin, hydrochloride, digitonin, α-hederin, syringin, salicin and salicin + emulsin.—ROBERT FISCHER. *Arch. Pharm.*, 275 (1937), 516. (L. L. M.)

Papain—Effect of Storage upon Activity of. The first change in a papain preparation with age is in activation, accompanied by a loss of the sulfhydryl substance that reacts with nitroprusside, but without the destruction of the enzyme. This, however, is followed by a gradual loss of proteolytic power even in the presence of cysteine. It must therefore be concluded that the enzyme is slowly inactivated and even more slowly destroyed on exposure to air in the dry state.—ROBERT R. THOMPSON. *Ind. Eng. Chem.*, 29 (1937), 1047. (E. G. V.)

Phosphatase—Alkaline Activation of, by Magnesium Salts. In solutions in which the enzyme concentration is high and where glycerophosphate is nearly in equilibrium with its cleavage products, the action of magnesium salts on alkaline phosphatase is both limited and temporary. With very low enzyme concentrations the effect is large and increases with time. Partial inactivation of the enzyme is retarded on the addition of magnesium salts, but this treatment will reactivate a completely exhaused enzyme. An investigation was made of the kinetics of the phosphatase action.—C. CATTANEO, M. C. GABRIELLI and G. SCOZ. *Enzymologia*, 2 (1937), 17–30; through *Physiol. Abstr.*, 22 (1937), 586. (F. J. S.)

Phosphatides—Chemistry (and Physiology) of, and Their Utilization in Industry. A brief review.—E. B. WORKING. *Oil and Soap*, 13 (1936), 261–263; through *J. Soc. Chem. Ind.*, 56 (1937), B., 81. (E. G. V.)

Phosphatides—Rapeseed. Rapeseed phosphatides have not the same phosphorous content as is found in products of animal origin. Even careful purification employed did not increase the phosphorous content above 3.14% in the alcohol-soluble fraction. On the other hand data indicates that there is not a great deal of difference in the phosphatides of oil-bearing seeds.—B. REWALD. *J. Soc. Chem. Ind.*, 56 (1937), 403T. (E. G. V.)

Phosphatides—Soy. Soy beans contain on the average 40% protein, 20% fat and from 1.6 to 3% phosphatides, mainly lecithin and cephalin. For commercial purposes 95% alcohol at a temperature of 75° is suitable for extraction of the phosphatides, which require about 4 hours for extraction. Optimum extraction efficiency is obtained if the beans contain 12% moisture and if they have been stored in a warm, moist place. Among other uses the phosphatides are used in cosmetics and insecticides.—A. A. HORWATH. *J. Chem. Educ.*, 14 (1937), 424. (E. G. V.)

Piule, a Mexican Intoxicating Drug. The author has demonstrated the presence of a glycoside in the seeds of *Ipomœa sidæfolia* Choisy (*Convolvulaceæ*). In Mexico the drug is known as "piule" or "ololiuqui." The glycoside apparently consists of an alkaloid combined with sugar and accordingly represents a gluco-alkaloid. Animal experimentation on frogs, white mice and rabbits indicates a definite cerebral depressant action both before and after cleavage of the glycoside by boiling with hydrochloric acid. According to Mexicans, when the drug is consumed as an intoxicating beverage, strong and characteristic psychic symptoms are produced. Earlier research by scientific investigators instituted upon humans could not confirm these reports. Possibly the mention of intoxicating beverage contributed to the development of psychic phenomena. The author also points out that psychically active drugs (opium, coca) do not have a uniform effect on different races of men, that sometimes individual temperament plays a part therein. The drug deserves to be subjected to an exhaustive investigation with more abundant material.—C. G. SANTESSON. *Arch. Pharm.*, 275 (1937), 532. (L. L. M.)

Rubiadin—Synthesis of. Jones and Robertson proved by synthesis that rubiadin is 1,3-dioxymethyl-2-anthraquinone. Previously Mitter and Gupta condensed 3,5-dioxy-*p*-toluic (m. p. 175–176°) and benzoic acids to a product which they considered rubiadin. However, Asahina and Asano found the melting point of 3,5-dioxy-*p*-toluic acid (+ $^1/_2$ water) to be 262°. Therefore it was desirable to repeat the synthesis of Mitter and Gupta. 0.5 Gm. 3,5-dioxy-*p*-toluic acid (m. p. 262°) and 4.0 Gm. benzoic acid in 25 Gm. concentrated sulfuric acid were heated 15 hours in an oil-bath to 120°. The product was poured into water and steam distilled. The non-volatile residue was washed with hot water and recrystallized from benzene: yellow needles, $C_{15}H_{10}O_4$, m. p. 290°; (yield 70%); diacetate, m. p. 225°. 1,3,5,7-tetra-oxy-2,6-dimethyl-anthraquinone was obtained by the condensation of 2 moles (0.5 Gm.) 3,5-dioxy-*p*-toluic acid in 12.5 Gm. concentrated sulfuric acid heated 15 hours in an oil-bath at 120°. The product was separated by dilution with water and reprecipitated from diluted acetone: orange-red plates, $C_{16}H_{12}O_6$, decomposed at 333°; yield, 0.15 Gm.; tetra-acetate, m. p. 278–279°.—T. KUSAKA. *J. Pharm. Soc. Japan*, 55 (1935), 110–111. (R. E. K.)

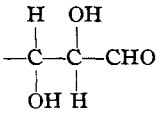
Sedum—Some Derivatives Obtained from the Species of. A ketose was isolated by the author from the crude drug of *Sedum acre* L., *Sedum reflexum* L. and *Sedum boloniense* L. The compound was of a syrupy appearance. The sugar reacted to form an osozone $C_{19}H_{24}O_5N_4$; it occurs in yellowish needles m. p. 197–198°, $[\alpha]_D^{20} = + 5.12°$. This osozone is identical with sedoheptose which was discovered by other investigators. A solution of the heptose reacts with phenol and other acids to give the so-called "furfurol" reaction. According to some investigators this reaction is the same for heptose as for arabinose; others claim that this reaction is different, for each of the sugars. In the method submitted by Allen and Tollens the heptose turns from an orange to a violet and finally to an olive-green color; the amyl alcohol solution of the sugar is emerald-green. According to Neuman and Haar the color should be blood-red. Rosenthaler gives the color as orange-yellow. The absorption spectrum of heptose is different than that of arabinose. The heptose absorbs the red color slightly, but has a wide absorption band of the violet-blue color. The pentose absorbs two bands of the red color.—M. PRONER. *Wiadomości Farmac.*, 62 (1935), 742; through *Chem. Zentr.*, 107 (1936), 2355. (G. B.)

Starch. Definitions, properties and utilization of starch and starch products are given. The gelatinization of starch and starch products is discussed.—ROBERT S. SHANE. *J. Chem. Educ.*, 14 (1937), 460. (E. G. V.)

Takadiastase—Action of, on the Phosphoric Monoesters of Propyl and Isopropyl Alcohols. The optimum p_H for hydrolysis of propyl and isopropyl phosphoric esters is displaced toward the zone of less acidity when the concentration in the substrate is increased. Takadiastase has greater affinity for isopropyl phosphate than for its isomer, but hydrolyzes the *n*-propyl phosphate more rapidly. The affinity of the phosphatase with respect to the two isomers increases with the acidity.

—J. COURTOIS and P. DENIS. *Bull. soc. chim. biol.*, 3 (Mar. 1937); through *J. pharm. Belg.*, 19 (1937), 597. (S. W. G.)

Urease Production by Proteus Vulgaris—Effect of Carbohydrates and Allied Substances on. The conclusion of Jacoby that the group



is an essential "brick" for the formation of urease by *Proteus vulgaris* is not confirmed. The urease production was increased by 100% by the addition of arabinose to the culture medium, 40% by glycerol, and variably so by fructose and galactose; it was decreased 50% by glucose and lactate. The total growth was diminished by all these substances.—R. PASSAMORE and J. YUDKIN. *Biochem. J.*, 31 (1937), 318–322; through *Physiol. Abstr.*, 22 (1937), 588. (F. J. S.)

Other Plant Principles

Canada Balsam Oil. Source of *l*-β-Phellandrene. Phellandrene was recognized as a constituent of oil of bitter fennel as long as 1842 by Cahours and has subsequently been detected in a number of essential oils by fermentation of the nitrosite. Wallach (1902–1904) was able to show that two distinct terpenes existed which he designated α-phellandrene and β-phellandrene. The *d* and *l* forms of α-phellandrene have been isolated from eleni and eucalyptus oils, respectively. The product usually sold as phellandrene is the *l*-α-variety obtained from the oil of *Eucalyptus dives*. *d* β-Phellandrene was first isolated from the oil derived from the fruits of *Phellandrium aquaticum* L. and additional sources have since been found in the oils from *Bupleurum fruticosum* and *Skimma laureola*. No readily obtainable oil was available as a source of *l*-β-phellandrene, and in some cases the lævorotatory terpene has been diagnosed on insufficient grounds. Except in the case of the oil of *Pinus contorta*, the phellandrene fractions were isolated from complex oils and in no case was substantially pure *l*-β-phellandrene obtained or its contents determined. The isolation of this terpene in a relatively pure state is of considerable interest. Smith and West call attention to the discrepancies in the constants recorded for the nitrosite and quoted as identifying the terpene. The constants for the freshly distilled Canada balsam are given. The authors confirmed the presence of the only recorded constituent (*l*-α-pinene) and identified β-pinene and *l*-β-phellandrene in appropriate fractions of the oil obtained by fractional distillations under reduced pressure. The constants for the *l*-β-phellandrene are given. The tendency of the terpene to become modified on exposure to the air was shown by the increase in the specific gravity after storing for a few weeks in a partly filled bottle. The process appeared to be greatly accelerated in the presence of sodium sulfate. The nitrosite prepared from the terpene did not display the rapid mutarotation in chloroform solution shown by the corresponding *l*-α-phellandrene α-nitrosite. The identity of the β-isomeride was confirmed by oxidation with potassium permanganate solution to the glycol which when treated with dilute sulfuric acid was converted (by loss of water, followed by molecular change), to phellandral.—ANON. *Perfumery Essent. Oil Record*, 28 (1937), 326. (A. C. DeD.)

Pinene—Terpineol from. The method comprises of treating pinene with a mixture of formic acid (about 60 to 75 per cent by weight) and orthophosphoric acid (about 60 to 75 per cent by weight). The amount of phosphoric acid in the mixture comprises about 20 to 40 per cent by weight of the formic acid present.—ANON. *Perfumery Essent. Oil Record*, 28 (1937), 283. (A. C. DeD.)

Resinoides, Absolute as New Ideal "Fixateures" and Perfume Bases. The purified resins and balsams are called resinoids, resinofixes, extrodores, fixaromes, baumaromes, claires and "fixateures." Those obtained from gum-resins are *galbanum absolute*, 15% yield from galbanum, thin bright yellow oil with a penetrating, bitter green galbanum odor, d_{20} 0.957, $[\alpha]_{D_{20}}$ + 4.6°; myrrh produces 12–15% *myrrh absolute*, a somewhat thick brown oil with a strong bitter aromatic odor and taste, d_{20} 1.02, $[\alpha]_{D_{20}}$ − 32.5°; opoponax gives about 8% *opoponax absolute*, a yellow somewhat thick oil with a very strong sweet spicy odor, d_{20} 0.912, $[\alpha]_{D_{20}}$ − 9°; olibanum offers 40% *olibanum absolute* a bright yellow thick oil with a very pleasant strong frankincense odor, d_{20} 1.044 and $[\alpha]_{D_{20}}$ + 7.65°. Uses of each are given.—A. M. BURGER. *Riechstoff-Ind. Kosmetik*, 12 (1937), 121–122. (H. M. B.)

Resinoids, Absolute as New Ideal Fixatives and Perfume Bases. II. Balsams. (*a*) Tolu balsam consists chiefly of toluresin, a mixture of cinnamic and benzoic acid esters with toluresinatol and is easily soluble in alcohol, acetone, glacial acetic acid, insoluble in petroleum ether and benzene. The petroleum ether-soluble portion represents 2–10% of the balsam and consists of cinnamic and benzoic acid esters as well as vanillin and some terpenes. By extraction with petroleum ether the author obtained a yield of 8–10% *tolu absolute*, a brownish liquid crystallizing after a time, $[\alpha]_D^{20} = +2.8°$, $d_{20} = 1.09$, odor strongly bassamic similar to Siam benzoin but without the vanilla note, (*b*) *Peru absolute* is a bright yellow liquid, odor similar to tolu and is flowery, $[\alpha]_D^{20} = 0°$, $d_{20} = 1.065$. **III. Resins.** (*a*) *Siam benzoin absolute*, 6–8% yield, is a viscous yellowish mass solidifying $[\alpha]_D^{20} = +8°$, $d_{20} = 1.075$, (*b*) *Sumatra benzoin absolute* was also prepared, (*c*) styrax is 50–80% soluble in alcohol, 60–70% in benzene, 20–30% in petroleum ether and yields *storax absolute* containing the aromatic principles of the drug, a colorless viscous liquid, solidifying in the cold, chiefly cinnamyl, propyl, benzyl and ethyl cinnamates, styrol, and vanillin, $[\alpha]_D^{20} = +13.6$, d_{20} 1.106. Odors of resinoids are described in detail and their uses discussed.—A. M. BURGER. *Riechstoff-Ind. Kosmetik*, 12 (1937), 125–126. (H. M. B.)

Resins and Volatile Oils—A Contribution to Analysis of. I. The author gives a brief review of the chemistry of the isomeric resin acids of the Conifers. A method for determining the various acids present by polarization, and then calculating the per cent of acids present by a formula, is described also.—WILHELM SANDERMANN. *Seifensieder Ztg.*, 64; *Der chem.-techn. Fabrikant*, 34 (1937), 402–403. (N. L.)

Saponins—Colloidal-Chemical Properties of. This paper describes the investigation of a specially purified saponin from white soaproot (*Gyspophila struthium* L.). The determination of the acid equivalent and the reciprocal hexol number of the sol are discussed and described. Properties of other sols including that of lecithin are also discussed.—R. RUYSSEN. *Pharm. Tijdschr.*, 14 (1936), 101. (E. H. W.)

Saponin. XI. The Sapogenin from the Root of Momordica Cochinchinensis. The authors confirm the finding of Miyake and Fuwa that the sapogenin from the saponin momordin has the empirical formula $C_{30}H_4O_3$. It is identical with oleanolic acid. This was shown by a comparison of the free acid, melting point 309.8°, $[\alpha]_D$ 78.3° and the pre-separation of its monoacetate, methyl ester, acetyl methyl ester, the monobenzoate and the benzoylmethyl ester. The methyl ester, mono oxime and the mono semicarbazone of the momorgenonic acid obtained by oxidation were likewise prepared. All of these derivatives were identical with the corresponding derivatives of oleanolic acid.—S. KUWADA and Y. FUWA. *J. Pharm. Soc. Japan*, 55 (1935), 87–88. (R. E. K.)

Theine—Preparing Tea Free from. A process for preparing tea free from theine without employment of steam and heat consists in applying solvents which are low boiling for withdrawing the aroma substances from the tea, thereupon applying basic compounds dissolved in alcohol for splitting up the theine salts, applying a volatile solvent for removing the theine, then adding the solution of aroma substances and finally vaporizing the solvent. Suitable solvents are acetylene dichloride, methyl chloride or ethyl chloride.—KARL HEINZ BARUTH. U. S. pat. 2,085,489, June 29, 1937. (A. P.-C.)

Tragacanth Gum—Relationship between the Constitution of, and Viscosity of Its Mucilage. A method is described for the estimation of the soluble and insoluble constituents of tragacanth gum and the results obtained with 12 samples are given. The methoxyl content has been shown to be a characteristic for the bassorin present in the samples investigated; and it may be concluded that a tragacanth of high bassorin content or methoxyl content will yield a mucilage of high viscosity. However, some gums yield mucilages of far higher viscosities than would be deduced from a knowledge of their bassorin or methoxyl contents. The saponification values of tragacanth gums have been found to bear no relationship to any other physical or chemical constants determined for the samples. It is suggested that the monograph on Tragacanth of the B. P. be modified to require a bassorin content of not less than 60% when determined by the assay process described; a methoxyl content of 3.75%, determined by the Zeisel process, and a concentration of not more than 1.65% of gum to be required to produce a mucilage having a viscosity of 400 poises when determined by $^5/_{32}$-inch steel spheres in a falling sphere viscometer at 20° C.; the mucilage to be prepared in a bulk of 600 cc. by the dry flask process and allowed to stand for 48 hours before viscosities are determined. A description of the falling sphere viscometer and the method of calculating

viscosities by the Ladenburg formula should be inserted in an Appendix to the Pharmacopœia.—JACK M. ROWSON. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 161–176. (S. W. G.)

Fixed Oils, Fats and Waxes

Corn Poppy Seed—Oil of. The seeds of *Papaver rhoeados* yield about 22% of a yellow oil; by greater pressure a dark oil was also obtained. The oil has the following constants: $d_{20}/_{4}$ 0.9201, optically inactive, acid number 13.1, saponification value 186–189, iodine number (24 hours) 134–136, unsaponifiable portion 1.3%. These constants compare well with those for Oleum Papaveris somniferi.—WALTHER AWE. *Apoth. Ztg.*, 52 (1937), 750–751. (H. M. B.)

Fatty Acids—Iodine Derivatives of. II. Acids with 4 C-atoms. Two grams tetrolic acid were warmed until dissolved in 15 cc. of colorless hydriodic acid (sp. gr. 1.96). On standing β-iodocrotonic acid separated: m. p. 114°; anilide, m. p. 124°; reaction with sodium ethylate produced β-ethoxy-crotonic acid. Further reduction of 1 Gm. β-iodocrotonic acid, dissolved by warming in 10 cc. concentrated hydriodic acid, produced β-diiodobutyric acid: m. p. 97°; slightly soluble in cold, freely soluble in hot petrolic ether; anilide, m. p. 121°, from petrolic ether.—E. MASUDA. *J. Pharm. Soc. Japan*, 55 (1935), 95–96. (R. E. K.)

Milk-Fats—Some Minor Component Acids of, and Their Possible Significance. The evidence for the presence of lauric acid is not convincing. Of the saturated acids of higher molecular weight than stearic acid usually calculated as arachidic acid more than half is said to be "cerotic" (C_{26}) acid and the remainder composed of arachidic, behenic and lignoceric acids [Helz and Bosworth, *J. Biol. Chem.*, 116 (1936), 203]. The "cerotic" acid may be derived from the waxes of the grass eaten by the cattle. The C_{18} unsaturated ester fractions are calculated as a mixture of oleic and octadecadienoic acids. The latter does not give the reactions of linoleic acid and is assumed to be derived from the octadecadienoic acids of grass and to be a geometric isomer of plant seed di-ethenoid acids. The presence of decenoic, tetradecenoic and hexadecenoic acids has been indicated as well as polyethenoid acids such as arachidonic and others of the tetra- and penta-ene acids of the C_{20} and C_{22} series. In view of recent ideas of the oxidation of long carbon chains it is suggested that the lower molecular weight fats are derived from oleic glycerides. Cod liver oil added to the diet of cattle temporarily lowers the output of milk-fat and the proportion of the lower saturated fatty acids while increasing the proportion of oleic and more highly unsaturated acids.—T. P. HILDITCH. *Analyst*, 62 (1937), 250. (G. L. W.)

Molecular Distillation. State of the Vitamins in Certain Fish Liver Oils. When cod liver oil is heated in a molecular still most of the vitamin is eliminated in the first 3% of distillate. It is better, therefore, to distil a large bulk of oil and collect the first 5% which distils; this fraction is then redistilled, giving subfractions of relative large volume. Free vitamin A is less stable to heat or æration than its esters. Vitamin D exists in the original oil partly in the free state and partly as a mixture of esters, differing more widely in molecular weights than the Vitamin A esters.—K. C. D. HICKMAN. *Ind. Eng. Chem.*, 29 (1937), 1107. (E. G. V.)

Oils—Differentiation of, by Enzymic Hydrolysis. The use of enzymes as reagents is now being increasingly adopted in analytical practice. Because they are more selective in their action, enzymes are replacing other chemical methods for the determination and detection of complex substances of biological importance. It is possible to use certain enzymes as reagents for the differentiation of complex substances like starches, fats and proteins, and in such cases their use promises to be of considerable value. The most striking examples of such usefulness are to be found with amylase and lipase. The copper-soap test described for the detection of lipases has been modified and extended to the differentiation of fats and oils. The method described takes advantage of the difference in the fatty acids of oils hydrolyzed by lipase, which forms soaps with copper sulfate. The copper soaps obtained from the fatty acids of butterfat are sharply distinguished from those obtained from other oils, in that they produce different colors when treated with iodine solution.—K. V. GIRI and P. N. BHARGAVA. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 395. (E. G. V.)

Ointment Vehicle—Horse Fat as an. Horse fat is one of the lesser known animal fats and is of minor commercial importance only. It is somewhat more unsaturated than the commonly occurring animal fats. The fat from the crest of the horse is stated to be used in Switzerland as a domestic remedy for baldness and greying hair. When it is employed as an ointment for the scalp it is usual to add about 3% of paraffin wax or beeswax to stiffen it. In veterinary practice horse fat was found to be better than soft paraffin, because it did not cause irritation to horses' skins.

Horse fat can be considered as a low-grade, edible fat to be used in place of lard. The composition per cent of the mixed fatty acids from the fat of domestic and wild untamed horses is given.—ANON. *Pharm. J.*, 139 (1937), 275. (W. B. B.)

Olive and Tea-Seed Oils—Some Further Observations on the Component Glycerides of. The specimen of Palestine olive oil, contained the following component fatty acids (weight %): palmitic, 10.7; stearic, 3.6; arachidic, 0.1; oleic, 76.4; linoleic, 9.2. It resembles closely the majority of olive oils from other sources in the composition of its fatty acids. The cause of the discrepancy observed in earlier work on the tri-C_{18} glyceride content of olive and tea-seed oils has been investigated. It appears that the method employed gives low results with mixtures of saturated triglycerides containing between 50 and 70% tristearin, and cannot be regarded as trustworthy over this range; for mixtures containing below 40% or above 75% of tristearin the procedure has been found to give very satisfactory results. The determination of tri-C_{18} glyceride content by examination of the mixed saturated-unsaturated glycerides of an oil partly hydrogenated to a suitable stage or stages gives results consistent with the limits set by the fatty acid composition. The results obtained by this procedure for the olive and tea-seed oils show that the latter follow the usual rule, that the amounts of simple triunsaturated C_{18} glycerides are close to the minimum. This method is, however, more lengthy and tedious even than the determination of tristearin in a completely hydrogenated fat. Distillation of the unsaturated esters from the two oils through an electrically heated fractionation column, and also study of appropriate fractions of the unsaturated esters by means of oxidation or hydrogenation, has shown that hexadecenoic acid is present in small proportions, not more than 1% of the total fatty acids of the oils.—T. P. HILDITCH and H. M. THOMPSON. *J. Soc. Chem. Ind.*, 56 (1937), 434–438T. (E. G. V.)

Turtle Oil—Green. A specimen of green turtle oil from *Chelonia japonica*, Thunberg, from the Bonin Islands, consisted of a mixture of body and liver oils, and was an orange-yellow liquid, showing a deposit at ordinary temperature. Very little color was given with antimony trichloride test, and in the Tortelli-Jaffé test an orange-yellow color developed without green fluorescence. The analytical figures for the oil agreed with those obtained by Lee for African turtle oil. The fatty acids melted at 28–29° C. and had neutralization value 211.4 and iodine value 65.8. The ether-insoluble (5%) and petroleum spirit-insoluble (7.6%) bromides were isolated and the proportion of bromine present determined. The fatty acids were converted into their methyl esters and fractionally distilled, and the fractions were examined for their component acids. The chief constituent was oleic acid, and myristic, palmitic and stearic acids were also present, with a small proportion of the highly unsaturated acids C_{20} and probably C_{18}. The proportion of myristic acid was fairly large and lauric and possibly zoomaric (palmitoleic) acids were present. Dodecenoic and tetradecenoic acids were not identified with certainty. The oil differs from most marine animal oils in comparative lack of C_{20} and C_{22} acids. The presence of cholesterol in the unsaponifiable matter was confirmed.—M. TSUJIMOTO. *J. Soc. Chem. Ind. Japan*, 40 (1937), 185–186B; through *Perfumery Essent. Oil Record*, 28 (1937), 273. (A. C. DeD.)

Wool Fat and Cacao Butter. The usefulness of these substances is discussed. Cream bases of the oxycholestrin type are mentioned together with several formulas for creams.—HANS SCHWARZ. *Seifensieder Ztg.*, 63 (1936), 260; through *Am. Perfumer*, 34 (1937), 68. (G. W. F.)

Unclassified

Alcohol—Cetyl. The physical and chemical properties are reviewed. The author discusses the hydrophylic properties and gives formulas for cold cream, toilet cream of 3 types, toilet, milk and lipstick.—FRANK ATKINS. *Mfg Perfumer*, 1 (1936), 7; through *Am. Perfumer*, 24 (1937), 68. (G. W. F.)

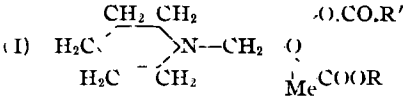
Alcohol—Heptyl, Ethers Derived from. In the present study the heptyl radicle is linked by way of the oxygen with radicles corresponding to (1) the alcohols of the acyclic series from methyl alcohol and lauric alcohol, (2) terpene alcohol, geraniol and linalool, (3) the alcohols of the benzene series such as benzyl, phenyl-ethyl, cinnamic and phenyl-propyl and (4) phenols such as phenol, eugenol, iso-eugenol and *o*-, *m*- and *p*-cresols. The ethers were prepared by allowing a molecule of heptyl bromide to react with a molecule of the alcohol by means of a molecule of sodium amide in toluene and purified by submitting the product to an alkaline treatment to convert any unchanged bromide into heptyl alcohol followed by several distillations over sodium and then rectify 2–3 times. Twenty-six ethers, of which only six are described in literature, were prepared and

the properties including odor, lastingness, formulas, b. p., sp. gr., $n_{D_{20}}$ and solubility in alcohol at 15 . With combinations as in (1) the odor diminishes as the molecular weight increases; (2 and 3) produce highly odorous products, rather lasting in which the terpene note diminishes that of the heptyl; with (4) the phenolic influence predominates; derivatives corresponding to eugenol and iso eugenol are almost odorless when quite pure. –MAX ROGER and F. DVOLAITSKAYA. *Recherches*, 1 (1937), 13 -15. (H. M. B.)

Algæ– Iodine in. IV. Tri-iodo-ethanal (Iodal). The oxidation product which decomposes at 126–127 ' is tri-iodo-ethanal as 1. All other products of the nearly neutral oxidation are either iodine-containing ketones or acids; an aldehyde is a plausible intermediate. The substance cannot be tri-iodo-acetic acid because the latter decomposes in all solvents. 2. The decomposition is intermediate between methyl iodoform (decomposes at 95 °) and tri-iodoacetic acid (decomposes at 150). It does not explode like β-iodo-α-iodoso-ethylene. 3. It is oxidized instantly by potassium permanganate in acetone. 4. 20% potassium hydroxide decomposes it with the separation of iodoform, but the residual solution contains a reducing substance thought to be formic acid. The Japanese text contains photomicrographs of iodal. E. MASUDA. *J. Pharm. Soc. Japan*, 55 (1935), 97–98. (R. E. K.)

Ammonium Salts, Cyclic, Containing Acylated Hydroxyhydrocarbon Radicals. Colorless, soap-like products, forming strongly foaming solutions and suitable for various uses, including therapeutic purposes, and which have the general formula halogen-X-R_1OCOR_2 (where R_1 represents an aliphatic hydrocarbon radical containing at least two carbon atoms, X the nitrogen atom of a heterocyclic tertiary base which is capable of combining by addition with a halogen alkyl, the halogen atom being connected with the nitrogen atom X, and the nitrogen atom X and the oxygen atom -O- being connected with different carbon atoms, and where R_2 is an aliphatic or hydroaromatic radical containing at least seven carbon atoms) are obtained by causing a heterocyclic tertiary base and an acyl halide of the general formula R_2CO-halogen (where R_2 has the significance defined above) to react in any desired sequence with a compound of the general formula halogen-R_1OH (where R_1 has the significance defined above and where the hydroxyl group and the halogen atom are connected with different carbon atoms). Suitable starting materials which may be employed include, *e. g.*, ethylene, propylene, trimethylene chloro-, bromo- or iodo hydrins, heterocyclic bases such as pyridine, alkylpyridines, *N*-alkylpiperidines, *N*-alkylpyrrolidines, nicotine, etc., and halides of various aliphatic and hydroaromatic carboxylic acids containing at least eight carbon atoms such as stearic, oleic, palmitic, lauric, myristic or naphthenic acid.—CHARLES GRANACHER, assignor to SOCIÉTÉ POUR L'INDUSTRIE CHIMIQUE À BASLE. U. S. pat. 2,089,602, Aug. 10, 1937. (A. P.-C.)

Anesthetics - New Local Synthesis of. II. Compounds possessing the following general formula:



(I)

and having strongly local anesthetic properties were prepared starting with α-hydroxy-β-chloro-isobutyric acid which was first esterified with alcohol, propyl, isopropyl and benzyl alcohols and the resulting esters heated with piperidine in dry C_6H_6 solution under pressure at 100 ° and the crude condensation products were directly acetylated with benzoyl chloride or *p*-nitro-benzoyl chloride. The hydrochloride of (I) was purified and the products in the case of the *p*-nitrobenzoyl derivatives were further reduced to the amino compounds. An alternative scheme was also used in which chloroacetone was condensed with piperidine to piperidino-acetone which reacts with potassium cyanide to give β-piperidino-α-hydroxy-isobutyronitrile. Procedures for the preparation of the hydrochlorides of the following compounds are offered: (*a*) Ethyl-α-benzoyloxy-β-piperidinoisobūtyrate, $C_{18}H_{26}O_4NCl$, needles (from hot acetone), melting at 128 °, (*b*) Hydrochloride of ethyl-α-*p*-aminobenzoyloxy-β-piperidinoisobutyrate, $C_{18}H_{26}O_6N_2Cl.C_3H_6O$, needles (alcohol and hot acetone) melting at 76 , (*c*) Ethyl α-*p*-aminobenzoyloxy-β-piperidinoisobutyrate, $C_{18}H_{27}O_4N_2Cl$, melting at 102 °, (*d*) Propyl-α-benzoyloxy-β piperidinoisobutyrate (R = C_3H_7; R′ = propyl), $C_{19}H_{24}O_4NCl$, melting at (acetone-ether mixture) 115 ; (R = iso-C_3H_7; H in place of R.OO), $C_{12}H_{24}O_3NCl$, melting at 115° (from alcohol-ether mixture), (*e*) Hydrochloride of isopropyl-α-

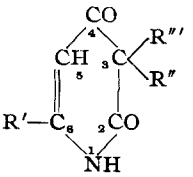
benzoyloxy-β-piperidinoisobutyrate (R′ = phenyl, R = iso-C_3H_7), $C_{19}H_{28}O_4NCl$, melting at 156° (from a mixture of hot acetone-ether mixture), (*f*) Hydrochloride of isopropyl-*p*-nitrobenzoyloxy-β-piperidinoisobutyrate, $C_{19}H_{27}O_6N_2Cl$, needles (acetone-alcohol mixture) melting at 61°, (*g*) Hydrochloride of benzyl-α-benzoyloxy-β-piperidinoisobutyrate, $C_{23}H_{28}O_4NCl$, melting at 195–197° (ether-alcohol mixture).—KIDAR NATH GAIND, ABDUL WAHAB KHAN and JNANENDRA RÂY. *J. Indian Chem. Soc.*, 14 (1937), 237–240. (H. M. B.)

***p*-Arsanilic Acid—New Derivatives of.** During the last few years some 100 active arsenicals have been prepared with a view to replacing or supplementing Tryparsamide (II), some of which have appeared less toxic and more active. Of these Neocryl was selected for human trials.—G. MORGAN and E. WALTON. *Chemistry and Industry*, 56 (1937), 853; cf. *Pharm. J.*, 139 (1937), 296. (E. G. V.)

Compounds with Santonin-Like Constitution—Synthesis of. I. o-Oxyhydratropic Lactone. The following steps were employed to synthesize *o*-oxyhydratropic-acid lactone: *o*-methoxy benzaldehyde and hydrocyanic acid reacted to form *o*-methoxy mandelonitrile, which was reduced by hydriodic acid to *o*-methoxy-phenylacetic acid and then esterified. Ammonia converted the ester to the amide, with which phosphorus pentachloride produced *o*-methoxyphenylacetonitrile (I). By adding iodoform in small portions to a mixture of I and dry sodium methoxide, the formation of *o*-methoxyhydratropic-nitrile (II) (b. p. 104–106° at 2 mm.) was affected. Hydrochloric-acetic acid mixture hydrolyzes II to *o*-methoxy-hydratropic acid, m. p. 105°. Hydriodic acid produces *o*-oxyhydratropic lactone (III): b. p. 88–90° at 2 mm.; d_{22} 1.1518; n_D^{22} 1.53268; acetophenone-like odor. Concentrated ammonia converts III to *o*-oxyhydratropic-amide, m. p. 117° from $CHCl_3$. Saponification of (III) and careful acidification at 0° liberates the free acid; $C_9H_{10}O_3.H_2O$, m. p. 59° from benzene; when warmed or dried over sulfuric acid the acid reverts to the lactone.—T. KARIYONE and S. IMAI. *J. Pharm. Soc. Japan*, 55 (1935) 109–110. (R. E. K.)

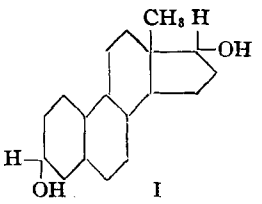
2,4-Dioxo-3,3-Dialkyltetrahydropyridines. For the production of 2,4-dioxo-3,3-diethyltetrahydropyridine, aminomethylene diethylacetoacetic ester (obtained by the action of ammonia on hydroxymethylenediethylacetoacetic ester) is treated with an alkaline condensing agent in alcoholic solution. The product melts at 98° to 99° C., forms colorless crystals that are easily soluble in warm water, slightly soluble in cold water and easily soluble in various organic solvents but not in gasoline; it forms well-crystallized stable compounds with pyrazolone derivatives. This product and similar dialkyl compounds have a strong soporific action and may be used as medicines.—ERNST PREISWERK and OTTO SCHNIDER, assignors to HOFFMANN-LA ROCHE, INC. U. S. pat. 2,090,068, Aug. 17, 1937. (A. P.-C.)

2,4-Dioxotetrahydropyridine—Derivatives of. By reaction of allyl halides or their 2-substituted derivates with alkali salts of 2,4-dihydroxypyridine or 2,4-dihydroxy-6-methylpyridine or their derivatives mono-alkylated in the 3-position, in aqueous solution in the presence of copper or copper compounds, highly soporific compounds are obtained of the general formula:

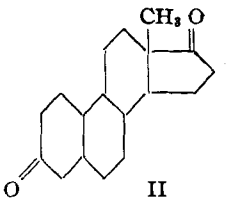


where R′ is hydrogen or alkyl, and R″ and R‴ are alkyl radicals, at least one of which is allyl or substituted allyl. The compounds are soluble in alkalies and strong acids and in solution produce no coloration with ferric chloride.—OTTO SCHNIDER, assignor to HOFFMANN-LA ROCHE, INC. U. S. pat. 2,090,237, Aug. 17, 1937. (A. P.-C.)

Germinal Gland Hormone Derivatives—Method of Making. Ketoalcohols having the formula $C_{18}H_{28}O$ are produced by subjecting reduction products of follicular hormones, having formula I (in which the substituent groups on each of the end rings are most likely in the positions



I



II

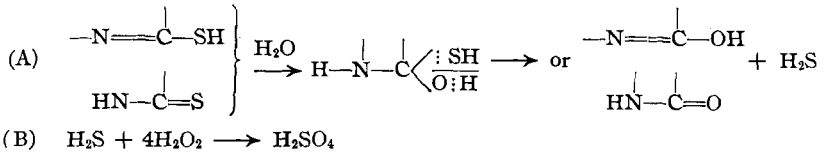
shown), to the action of oxidizing agents capable of transforming alcohols into ketones so as to obtain diketones of formula II, and then partially hydrogenating the latter into ketoalcohols.—WALTER SCHOELLER, FRIEDRICH HILDEBRANDT and ERWIN SCHWENK, assignors to SCHERING-KAHLBAUM A. G. U. S. pat. 2,094, 045, Sept. 28, 1937. (A. P.-C.)

Glycerol—Liberation, Recovery and Refining of. The composition and purity of crude and refined glycerins are dependent upon the composition of the original glycerides, the methods by which the glycerol was liberated, and the purification methods used. The article discusses the compositions of some typical glycerides, flow sheets of soap manufacture, methods of treatment, and purification and concentration.—ARTHUR GUILLAUDEAU. *Ind. Eng. Chem.*, 29 (1937), 729. (E. G. V.)

Lysergic Acid Amides of Organic Bases. Compounds of the type of ergot alkaloids are obtained by condensing lysergic acid azide with an organic base containing at least one labile hydrogen atom linked to the nitrogen (preferably in the presence of an acid-binding substance such as a sodium or potassium carbonate or hydroxide or with use of a sufficient excess of the reacting organic amine or of an amine such as pyridine, dimethylaniline, etc., to neutralize the hydrazoic acid formed in the reaction, preferably with cooling which may be to about 0° C.). Details are given of the production of racemic lysergic acid-isopropanolamide (melting point 220° to 225° C.), racemic lysergic acid-ethanol amide (forming two types of crystals melting at 152° to 155° C. and 165° to 175° C., respectively), *d*-lysergic acid-*d*-isopropanolamide (melting with decomposition at 195° to 196° C.), lysergic acid-tyramide (decomposes at 205° to 210° C.), *d*-lysergic acid-*l*-norephedride and *l*-lysergic acid-*l*-norephedride.—ARTHUR STOLL and ALBERT HOFMANN, assignors to CHEMISCHE FABRIK VORM SANDOZ. U. S. pat. 2,090, 430, Aug. 17, 1937. (A. P.-C.)

Polymeric Substances—Solubility Properties of Certain Highly. There are two kinds of interaction between a liquid and a highly polymeric substance: miscibility in all proportions, resulting in a solution or in a jelly, according to the fluidity of the mixture; or limited swelling, part of the liquid being absorbed by the swollen substance, while a certain part of the substance passes into the remainder of the liquid. Miscibility in all proportions is the only important form of interaction from the technical point of view. To attain miscibility in all proportions it is necessary that the solvent affect dispersion and swelling in a certain ratio and to such an extent as not to be impaired by the ballast of the solvent molecule. Each atom grouping of a solvent molecule exerts a dispersing, a swelling and a ballast action to a certain extent, dependent on the nature of the substance to be dissolved and the temperature. The effect of the molecule is the result of the specific action of its groups. The combined effect may also be obtained by applying a suitably composed mixture of the liquids. Heating tends to increase dispersion and to decrease swelling. In the case of highly polymeric substances having two characteristic groups, the ratio between these groups often determines the required ratio between dispersion and swelling groups of the solvent. It is impossible to express the solvent power of a liquid toward one or more highly polymeric substances in a reliable way by means of a quantity which is a function of physical constants of that liquid.—W. COLTOF. *J. Soc. Chem. Ind.*, 56 (1937), 375T. (E. G. V.)

Sulfur Compounds, Organic and Hydrogen Peroxide—Mechanism of the Reaction between. Previous papers reported that alkaline hydrogen peroxide converts an organic sulfur compound into the corresponding oxygen derivative and sulfuric acid. The reaction proceeds very smoothly and is always quantitative even at ordinary temperature and in 0.001 molar solution. The reaction is very general and differs in its mechanism from the usual reactions employing mercuric oxide, lead oxide and other oxidizing agents. The author postulates that the reaction mechanism is as follows:



(B) $H_2S + 4H_2O_2 \longrightarrow H_2SO_4$

This mechanism is discussed in detail for a wide variety of organic sulfur compounds and for a number of experimental conditions.—R. KITAMURA. *J. Pharm. Soc. Japan*, 55 (1935), 72–82. (R. E. K.)

BIOCHEMISTRY

Amino Acids, Acyl-Amino-Acids, Dipeptides, Acyl-Dipeptides and Derivatives of These Compounds. II. Effects of Irradiation with Cathode Rays and Ultraviolet Light. By spectroscopic measurements it was found that solutions of several amino acids and a large number of derivatives of amino acids and dipeptides change under the action of cathode rays and ultraviolet light, with liberation of ammonia gas in all cases. Whether the constituent amino acids are primary, secondary or tertiary, the radiation changes are the same. Reaction mechanisms are suggested.—A. J. ALLEN, R. E. STEIGER, M. A. MAGILL and R. G. FRANKLIN. *Biochem. J.*, 31 (1937), 195–204; through *Physiol. Abstr.*, 22 (1937), 572. (F. J. S.)

Ascorbic Acid—Determination of, with Methylene Blue. The authors specify the experimental conditions (p_H, concentration, temperature, nature of radiations, etc.) to be maintained during the determination of ascorbic acid by the method of Martini and Bonsignore, which is based on the decoloration of methylene blue in acid medium by ascorbic acid exposed to an intense light. The authors maintain that under the given conditions the methylene blue method is more specific than that of Tillmans (2–6 dichlorophenol-indophenol method). The results are not influenced by cysteine or glutathione.—C. MENTZER and VIALARD-GOUDOU. *Bull. soc. chim. biol.*, 3 (Mar. 1937); through *J. pharm. Belg.*, 19 (1937), 614. (S. W. G.)

Bile Acids and Carbohydrate Metabolism. It was found with the use of the Thunberg technic that dehydrogenations in frog and rabbit muscle, and rabbit liver, are inhibited by dehydrocholic acid. This inhibition is more marked in the tissue oxidation of the intestinal mucous membrane. The inhibition of methylene-blue reduction with tissue brei occurs also in the presence of glucose, mannose, fructose, glycogen and glycerophosphoric, lactic and pyruvic acids. Desoxycholic and cholic acids have stronger inhibiting actions than dehydrocholic acid.—T. FUKUI. *Arb. med. Univ. Okayama*, 5 (1937), 145–160; through *Physiol. Abstr.*, 22 (1937), 665. (F. J. S.)

Blood Sugar Method—Simplified, Based on Ferricyanide-Indigocarmine Titration. The blood is deproteinized with zinc hydroxide, heated with the ferricyanide reagent for six minutes in boiling water, and the reduced salt titrated with indigocarmine. The method is applicable to 0.1–0.2 cc. of blood and a table is given for amounts of sugar from 0.005–0.45%. The results with this method are in close agreement with those of the MacLean and Hagedorn-Jensen technics. The use of tungstic acid for precipitation of the protein results in figures similar to those of the Folin-Wu method.—J. PATTERSON. *Biochem. J.*, 31 (1937), 244–247; through *Physiol. Abstr.*, 22 (1937), 608. (F. J. S.)

Carbohydrate—Synthesis of Reserve, by Yeast. III. Nature of the Insoluble Carbohydrate. The insoluble carbohydrate fraction of yeast contains a polysaccharide, magnesium and phosphorus, and when treated with cold hydrochloric acid these constituents dissolved, leaving a carbohydrate residue insoluble in water and cold alkali. The soluble polysaccharide resembled glycogen but had a lower specific rotation and was less opalescent. The insoluble carbohydrate residue, when heated with normal hydrochloric acid, yielded glucose and a carbohydrate containing an acid group, having $[\alpha]_D$ + 10.7 and giving a triacetyl derivative. The "acid carbohydrate" which was slightly soluble in water, appeared to be the substance responsible for the immunological properties of yeast; in its serological properties it resembled the Type II pneumococcus specific polysaccharide, but was not identical with it.—R. A. MCANALLY and I. SMEDLEY-MACLEAN. *Biochem. J.*, 31 (1937), 72–80; through *Physiol. Abstr.*, 22 (1937), 741. (F. J. S.)

Chlorine—Determination and Value of the Ratio of Erythroplasmatic. The divergent results reported by others are not caused entirely by varying conditions for the separation of the

corpuscles and plasma. The use of sodium polyanetholsulfonate (Roche) (0.20 parts per liter) is recommended as the anticoagulant as it does not modify the permeability of the corpuscular membrane and does not retard the migration of the chloride ion from the corpuscles to the plasma as is the case with citrate and oxalate. The maximum packing of the erythrocytes is obtainable only by centrifuging at 4200 r. p. m. for 25 minutes or 5000 r. p. m. for 5 minutes. For the chloride-ion determination the hot method of Laudat or the cold method, necessitating a clarification of the plasma and corpuscles may be employed. In the latter case operation on a macroanalytical scale is advised.—M. PAGET. *Bull. soc. chim. biol.* (May 1937); through *J. pharm. Belg.*, 19 (1937), 597. (S. W. G.)

Corticalin—New Method of Preparing. The principles of this method of isolating the active substance of the suprarenal cortex consist of extraction with dilute hydrochloric acid and precipitation with sodium stearate.—N. B. MEDWEDEWA. *Bull. Biol. Med. exp. U. R. S. S.*, 1 (1936), 239; through *Physiol. Abstr.*, 22 (1937), 683. (F. J. S.)

Dental Caries—Nature of Diet in Its Relationship to Control of. Vitamin D proved to be efficacious in preventing and, in larger doses, arresting caries.—JULIAN D. BOYD, CHARLES L. DRAIN and GENEVIEVE STEARNS. *Proc. Soc. Exptl. Biol. Med.*, 36 (1937), 645. (A. E. M.)

Dirt in Milk—Report of the Sub-Committee on. The following sections are reported in detail. (A) Introduction. (B) The substances to be determined and the method of expressing the results. (C) Recommended method for the determination of dirt in fresh milk. (D) Determination of the origin of the dirt in milk. (E) Determination of dirt in sour or decomposed milk. (F) (1) Instructions to sampling officers. (2) Determination of dirt in milk in three parts of a divided sample. (3) Determination of sediment in a dung suspension. (4) Determination of dirt in milk containing known amounts of air-dried lung. (5) Results of determination of dirt in milk samples by the Sub-Committee's method. (6) Photographs of apparatus.—*Analyst*, 62 (1937), 287. (G. L. W.)

Foods—Canned, Antiscorbutic Value of. II. A comparison of raw vegetables, canned vegetables and vegetables cooked without pressure (as in the household) showed that the latter retained substantially the same amount of vitamin C as canned vegetables. On the whole, the weight curves and the appearance of the experimental animals (guinea pigs) were better with the canned or cooked vegetables than with the raw vegetables, indicating that cooking permits a better utilization of the food.—M. A. MACHEBOEUF, H. CHEFTEL, MELLE. M. L. PIGEAUD and MELLE. M. L. THUILLOT. *Bull. soc. sci. hyg. aliment.*, 25 (1937), 298–307. (A. P.-C.)

Fruit Juices—Recent Work on the Concentration of, and Fruit Drying. Processes of evaporation must follow the principles that (*a*) the process must be continuous, (*b*) time of contact must be as short as possible and (*c*) the temperature must be as low as possible. An evaporator is described which follows these principles.—J. A. REAVELL. *Chemistry and Industry*, 56 (1937), 618. (E. G. V.)

Histamine—Estimation of, in Blood. Extracts of the small intestine of the horse and other animals contain five vasodilator substances—histamine, choline, acetylcholine, adenylic acid and an unidentified substance known as substance P. The histamine present can be measured by its vasodilator action on the cat's blood pressure after destroying the last three substances by boiling the acidified extract and excluding the effect of choline by giving atropine. The presence of histamine in blood was first observed in rabbit's blood, which contains larger amounts than other species; concentrated extracts from blood of other animals may be prepared as follows. The proteins are precipitated with trichloracetic acid; after filtration, hydrochloric acid is added and the extract is boiled. This destroys adenylic acid and vasoconstrictor substances. The extract is evaporated to dryness and the histamine extracted from the dry residue with alcohol which leaves behind most of the inorganic salts. The extract is then dried again and taken up in water; it is tested in comparison with histamine for its effect on guinea-pig intestine. The identity of the substance in blood with histamine has been confirmed by using the fact that tissues like the guinea-pig's intestine, when treated with a large amount of histamine, will no longer respond to histamine, although they respond normally to other substances. It has been demonstrated that histamine is released in the body in anaphylaxis, and after temporary arrest of the circulation; also after extensive burns; a recognition of the clinical importance of this release is still in an early stage.—J. H. GADDUM. *Proc. Roy. Soc. Med.*, 29 (1936), 1373; through *Quart. J. Pharm. Pharmacol.*, 10 (1937), 134. (S. W. G.)

Insulin—Cystine Content of. The sulfur of insulin can be entirely accounted for as cystine on the basis of the Sullivan method within the experimental error of the method. Not more than traces of other compounds can be present. The cystine content of crystalline insulin, containing 3.34 ± 0.03% sulfur on a moisture-free, ash-free basis, is shown to be 12.5 ± 0.4%. The lower values previously obtained by the Sullivan method, namely, 8–9%, are shown to be due probably to incomplete hydrolysis on the one hand and destruction of the cystine during the hydrolysis on the other. In the present investigation the hydrolyzing agent used was 20% hydrochloric acid in 50% formic acid based on the hydrochloric-formic acid procedure of Gurin and Clarke. The cystine was apparently protected from destruction during the hydrolysis.—G. L. MILLER and V. DU VIGNEAUD. *J. Biol. Chem.*, 118 (1937), 101–110; through *Physiol. Abstr.*, 22 (1937), 573. (F. J. S.)

Insulin—Studies on the Constitution of. I. Properties of Reduced Insulin Preparations. Insulin, as the native and fully active hormone, contains no free —SH group. Results of chemical and physical experiments suggest that one or two dithio (—S—S—) linkages in insulin have a special function. The hypothesis of Bersin is being investigated.—K. G. STERN and A. WHITE. *J. Biol. Chem.*, 117 (1937), 95–110; through *Physiol. Abstr.*, 22 (1937), 464. (F. J. S.)

Lactic Acid—Detection of, in Gastric Contents. The conditions for the application of Dènigés reaction to a gastric digest were found to be as follows: 5–10 cc. if neutral or alkaline are acidified with *N*/10 hydrochloric acid, boiled and filtered. The filtrate is rendered faintly alkaline with sodium carbonate and to each cc. about five drops of *N*/10 potassium permanganate are added and the fluid boiled until the manganese precipitate flocculates. After further filtration 2 cc. concentrated sulfuric acid are added to each 0.2 cc. The mixture is boiled for two minutes on a water-bath. After cooling, 23 drops of 5% alcoholic solution of guaiacol are added. A rose to carmine-red coloration indicates lactic acid. The test is sensitive to 25–50 mg. of the acid.—H. E. NEVER and E. VINCKE. *Klin. Wochschr.*, 15 (1936), 1910; through *Physiol. Abstr.*, 22 (1937), 644. (F. J. S.)

Leech Ponds—of Budapest. A brief description of a farm for the raising of leeches for blood-letting.—J. SCHOLZ. *Schweiz. Apoth.-Ztg.*, 75 (1937), 529. (M. F. W. D.)

Liver Extracts—Standardization of. The author finds that the injection of liver extracts produces an increase in the number of leucocytes, which is most easily observed in pigs. He suggests that liver extracts may be tested by this effect and gives an example. The initial leucocyte count varied from 16,000 to 40,000, and the count after injection varied from 18,000 to 57,000. The greatest effect was not produced by the largest dose of extract.—J. DEDICHEN. *Acta med. scand.*, 90 (1936), 195; through *Quart. J. Pharm. Pharmacol.*, 10 (1937), 138. (S. W. G.)

Metabolism—Tissue, Studies in. IX. Action of Colchicine and B. Typhosus Extract. Colchicine in almost toxic doses, like the filtrate from *B. typhosus*, produces hemorrhage in grafted tumors, reducing their ascorbic acid content and metabolism. In addition, colchicine also reduces the ascorbic acid of the liver and intestine of rats and mice, but does not interfere with the metabolism of the liver.—E. BOYLAND and M. E. BOYLAND. *Biochem. J.*, 31 (1937), 454–460; through *Physiol. Abstr.*, 22 (1937), 670. (F. J. S.)

Oxidation-Reduction—Studies on. XXIII. Ascorbic Acid. Ascorbic acid is the reductant of a thermodynamically reversible system, sluggish in electromotive activity. By the use of mediators the potential of the system has been determined throughout the p_H range 1.0–8.6. The normal potential of the system at 30° C. is +0.390 volt. The first dissociation constant of ascorbic acid has been determined at various ionic strengths, true value 6.2×10^{-4} (p_K 4.21). Values obtained for the potential in the alkaline range were unreliable partly because of the instability of the initial oxidant. Disappearance of the initial oxidant begins at about p_H 5.0 and increases rapidly with increase in p_H. At p_H 7.25 and 38° the half line of this oxidant is 2 minutes. The significance of these facts in relation to the chemistry and determination of vitamin C and also its rôle in biological processes is discussed. Determination of the oxidation-reduction titration curve of the ascorbic acid present in orange juice has permitted an accurate assay of its vitamin C content and has shown that dehydroascorbic acid, its primary oxidation product is not a natural constituent. The recent results of Borsook, Davenport, Jeffreys and Warner are discussed in an addendum.—E. G. BALL. *J. Biol. Chem.*, 118 (1937), 219–239; through *Physiol. Abstr.*, 22 (1937), 567. (F. J. S.)

Pasteurization and Vitamin A. After one-half hour warming to 70° C. in air with stirring neither the carotene nor the vitamin-A content of milk is altered.—C. G. HOLMBERG. *Skand. Arch. Physiol.*, 76 (1937), 109–114; through *Physiol. Abstr.*, 22 (1937), 650. (F. J. S.)

Peptides—Behavior of, in Aqueous Solutions. Cryoscopic and refractometric methods revealed that peptides which are composed of associating α-amino acids only show association in solution. Cryoscopic measurements of glycine and its di- and tri-peptides show an increasing association with increase in size of the peptide molecule. Peptides built up of associating and non-associating amino acids are not associated in solution. In the case of a series containing non-associating amino acids only, no support was found for the assumption that simple enlargement of the molecular size and repetition of the amido group could induce a tendency of the molecule to associate in solution, but this tendency exists if the α-amino acids forming the peptides possess this property.—M. FRANKEL. *Biochem. J.*, 31 (1937), 491–499; through *Physiol. Abstr.*, 22 (1937), 577. (F. J. S.)

Pregnancy Tests. Two types of hormones definitely increased during pregnancy: estrus-producing and gonadotropic. Description of effect on ovaries of infantile mice, and of mature rabbits, when injected with pregnancy urine. Causes swelling of follicles and filling with blood. May be detected in urine 10 days after coitus resulting in pregnancy. Disappears within seven days after birth of full-term child. Reaction is considered reliable test in diagnosis of pregnancy.—SELMAR ASCHEIM. *J. Am. Med. Assoc.*, 104 (1935), 1325. (M. R. T.)

Sex Hormones. A review.—M. A. LESSER. *Drug and Cosmetic Ind.*, 41 (1937), 57–60, 64. (H. M. B.)

Strychnine and Salivary Digestion. *In vitro* the activity of ptyalin is reduced in the presence of strychnine nitrate. The maximum effect is seen with dilutions of strychnine nitrate of about 1 in 50,000.—G. PARASINI. *Arch. Farmacol. sper.*, 63 (1937), 114–116; through *Physiol. Abstr.*, 22 (1937), 642. (F. J. S.)

Thyroids—Relation between Activity and Histology of. Thyroids showing a low epithelium and large follicle filled with homogenous colloid were shown to possess a great biological activity when tested on tadpoles; while the reverse was the case where the epithelium was tall and the follicles small and filled with deeply staining colloid.—A. A. VOITKEVITCH. *Bull. Biol. Med. exp. U. R. S. S.*, 1 (1936), 285–287; through *Physiol. Abstr.*, 22 (1937), 680. (F. J. S.)

Tyramine—Technic for the Determination of, in Spinal Fluid or Blood Serum. To 5 cc. (or less) of the fluid or serum add an equal volume of 20% trichloroacetic acid, filter, concentrate the filtrate to half its volume by boiling, cool and make alkaline with anhydrous sodium carbonate; extract the strongly alkaline solution with an equal volume of isoamyl alcohol, separate the latter and extract it with an equal volume of normal sulfuric acid; separate the acid layer which contains approximately half of the tyramine present in the original sample. To the sulfuric acid solution add one drop of a 0.1% alcoholic solution of α,β-nitrosonaphthol, heat to boiling and add one large drop of concentrated sulfuric acid; a red color which fades after a few min. indicates tyramine. For a rough determination use several dilutions of the sulfuric acid solution. The maximum dilution at which a color is obtained is about one part of tyramine per 1,000,000. The reaction is negative in normal serum and spinal fluid and in cases of essential hypertension. In hypertension due to nephritis or eclampsia it is always positive.—P. MULLER. *Compt. rend. soc. biol.*, 123 (1936), 128–130; through *Chimie & Industrie*, 38 (1937), 38. (A. P.-C.)

Tyrosine—Determination of, in Vegetable Substances. The author describes a technic permitting the determination of tyrosine directly in the primary vegetable matter. Exhaust first with alcohol in order to eliminate amino-phenolic bodies and pigments, then remove the fats with ether. Hydrolyze in an alkaline medium. The liberated tyrosine is determined colorimetrically by the Millon reaction, after removal of tryptophane as the insoluble mercuric complex —Y. RAOUL. *Bull. soc. chim. biol.* (May 1937); through *J. pharm. Belg.*, 19 (1937), 597. (S. W. G.)

***d*-Valine—Solubility of, in Water.** The solubility in water of *d*-valine (Hoffmann-La Roche) was determined over the temperature range 0–60° C. It was found that the solubility varies with the manner in which the crystals of the amino acids are obtained, and is therefore dependent on the crystal form.—J. B. DALTON and C. L. A. SCHMIDT. *J. Gen. Physiol.*, 19 (1936), 767–771; through *Physiol. Abstr.*, 22 (1937), 572. (F. J. S.)

Vitamin—Beriberi. The characterization of the beriberi vitamin, its isolation, the determination of its structure and its synthesis are discussed. This vitamin is required by all living things, both plant and animal. The uses of the synthetic vitamin are discussed in the light of this fact and of the probability of a wide-spread insufficiency of it in human diets.—R. R. WILLIAMS. *Ind. Eng. Chem.*, 29 (1937), 980. (E. G. V.)

Vitamin A—Discrepancy between Biological Assays and Other Methods of Determining. By exhaustive extraction with alcohol, rich concentrates of vitamin A have been separated into two fractions: a soluble fraction corresponding with vitamin A, and an insoluble fraction, highly abnormal and having a much greater biological activity than is indicated by the blue value; this exhibits a maximum at 285–290 mμ in the ultraviolet absorption spectrum, often without even an inflexion at 328 mμ. An interesting fraction from mammalian liver oil concentrate contained no detectable vitamin A, but was biologically active; its spectral characteristics are given. If the substance with these characteristics is responsible for the activity, this is 1/20 only of that of vitamin A and is not considered to be the cause of the major discrepancies encountered in fish-liver oils. Chromatographic adsorption resulted in similar but less striking fractions.—H. PRITCHARD, H. WILKINSON, J. R. EDISBURY and R. A. MORTON. *Biochem. J.*, 31 (1937), 258–265; through *Physiol. Abstr.*, 22 (1937), 650. (F. J. S.)

Vitamin A—New Photoelectric Method for Measuring. The diagram of the instrument is given. It incorporates the following features: (1) a monochromatic beam of light of high intensity, lying in the 3280 Å. region; (2) accurate measurement of the vitamin A absorption coefficient over the log I_0/I range of 0.1 to 1.0. With care this range may be extented somewhat; (3) rapid and easy measurements (the time required for a single measurement on a properly diluted oil is less than 2 minutes); (4) an accuracy of 1% in reading absorption coefficients, which may with care be pushed to less than 0.5%; (5) reproducible results day after day; (6) elimination of personal matching errors.—RONALD L. MCFARLAN, J. WALLACE REDDIE and EDWARD C. MERRILL. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 324. (E. G. V.)

Vitamin C—Absorption, Use and Excretion of, in Man. A review of the author's dissertation. The literature is discussed and experimental work described.—M. VAN EEKELEN. *Pharm. Tijdschr.*, 14 (1936), 92. (E. H. W.)

Vitamin C—Urinary Preservation of, by Paraffin. A layer of liquid paraffin keeps the vitamin content of urine practically unaltered for periods of forty-eight hours.—U. HAHN. *Klin. Wochschr.*, 16 (1937), 23; through *Physiol. Abstr.*, 22 (1937), 653. (F. J. S.)

Vitamin D—Eight Forms of. Properties are discussed and a review of the investigations leading up to the possible forms is offered. The number of forms appears to be as great as the number of sex hormones, which as sterol derivatives are chemically changed to this vitamin.—C. A. ROTHENHEIM. *Pharm. Monatsh.*, 18 (1937), 105–107. (H. M. B.)

Vitamin E. Rats kept on a diet deficient in vitamin E for 18 weeks had subnormal weights and were shown to be incapable of reproduction. When this diet was supplemented by the unsaponifiable fraction of wheat-germ oil autoclaved for one hour, or by a methyl alcohol extract derived from the unsaponifiable fraction of cottonseed oil, reproductive capacity was restored, but no increase in weight resulted. Other preparations derived from wheat-germ and cottonseed oils produced distinct increases in weight as well as restoration of fertility. The most likely explanation of these results is thought to be that separate fractions of vitamin E are responsible, respectively, for stimulating growth and maintaining fertility.—G. J. MARTIN. *J. Nutrition*, 13 (1937), 679–685; through *Physiol. Abstr.*, 22 (1937), 659. (F. J. S.)

Vitamin G Content of Some Foods. The Bourquin-Sherman and Munsell diets which are presumed to be deficient only in flavin, were used to assay "vitamin G." Cottonseed meal, soy beans, dried milk and dried brewer's yeast contained, respectively, 2.9, 2.4–3.2, 5.3 and 20–21 Bourquin-Sherman units of flavin per Gm.—H. LEVENE and R. E. REMINGTON. *J. Nutrition*, 13 (1937), 525–542; through *Physiol. Abstr.*, 22 (1937), 654. (F. J. S.)

Vitamins. The first paper gives a detailed survey of present-day knowledge of H, K and T, with data on A and the carotenoids and on D additional to those presented earlier. In the concluding paper the vitamins E, C, J, B_1, B_2, B_4 and B_6 are discussed.—H. WILLSTAEDT. *Klin. Wochschr.*, 15 (1936), 1505–1510, 1545–1549; through *Physiol. Abstr.*, 22 (1937), 649. (F. J. S.)

Vitamins—Knowledge of. A review.—A. RICHARD BLISS, JR. *Drug and Cosmetic Ind.*, 41 (1937), 188–190. (H. M. B.)

Vitamins—Sources of. The best sources of the following vitamins are listed: A, B_1, B_2, C, D.—ANON. *Pharm. J.*, 139 (1937), 37. (W. B. B.)

Yeast—Brewers', Sterols of. Total sterols can be determined by extracting and estimating colorimetrically by the Liebermann-Burchard method. Investigation of the optimum extraction conditions showed that a higher sterol yield is obtained from dried than from fresh yeast; grinding is facilitated by addition of a sufficient amount of very finely divided material such as infusorial earth. Acetone gives better results than alcohol, alcoholic sodium hydroxide, chloroform or ether, and removes the greater portion of the sterols at a lower temperature than alcohol. The sterols of yeast behave as though they were localized in the cellular membrane. This is supported by two main facts: (1) sterols are unaffected by plasmolysis, which acts on the protoplasm and nucleus; (2) the necessity of increasing the contact surface of the membrane and solvent separating the yeast cells. The sterols probably exist in the form of sterol-lecithide-proteid complexes, which are stable in the living cell but which seem to break down on drying or through the action of some protein-precipitating solvents (acetone, alcohol); a small portion of the sterols, however, remains bound in more complex combinations. No relation could be found between the sterol and lecithide contents of the yeast.—JACQUES GALIMARD. *Dr. Pharm. Thesis*, Paris (1934); through *Bull. soc. sci. hyg. aliment.*, 24 (1936), 417–418. (A. P.-C.)

ANALYTICAL

Acetic Acid—Colorimetric Determination of, and Its Salts. Spectrophotometric examined showed that in the determination of acetic acid and its salts with lanthanum nitrate and iodine (Damour, *Compt. rend. acad. sci.*, 43 (1857), 976; Biltz, *Ber.*, 37 (1904), 719), the intensification of the blue with increasing concentration of acetic acid is accompanied by changes in the tint, which interfere with the colorimetric estimation. Increasing the lanthanum concentration intensifies the color reaction but does not increase its sensitivity. Increasing the ammonia concentration retards the formation of blue, decreases its intensity and accelerates the precipitation. The presence of neutral salts interferes with the determination because of the lowered color intensity and the precipitation. In the presence of foreign salts the determination can be made at the concentration of 0.35 to 1.7 mg. of acetic acid in 1 cc. of solution, or at that of 2.5 mg. in 1 cc. by using a larger excess of ammonia.—R. V. TEISS and E. M. IOFINOVA-GOLDFEIN. *J. Prikl. Khim.*, 9 (1936), 957–964; through *Chimie & Industrie*, 38 (1937), 35. (A. P.-C.)

Alkali, Free, in Soap—Eliminating Inaccuracies in Present Official Method for Determining. An apparatus facilitating the exclusion of carbon dioxide while the soap sample is being dissolved by intermittent circulation of the ethyl alcohol solution is described; in order to avoid the dissolution of salts as well as of free caustic alkali (I) the concentration of the soap in the ethyl alcohol should be not less than 2.5%, and the insoluble residue should not be washed with fresh ethyl alcohol prior to the titration of (I).—E. R. LUCKOW. *Oil and Soap*, 13 (1936), 257–261; through *J. Soc. Chem. Ind.*, 56 (1937), B., 58. (E. G. V.)

Aluminum—New Fluorescent Test for. The orange-red fluorescence produced under ultraviolet light by Pontachrome Blue Black R with aluminum ion is sensitive to one part in 5,000,000 parts of water, and can be used in the qualitative detection of aluminum in the presence of beryllium and other elements with which it is commonly found. With argon bulbs, a cheap and convenient source of ultraviolet radiation, concentrations as low as one part of aluminum in 100,000 parts of water may readily be detected. The intensity of the fluorescence appears to vary with the aluminum content within a limited range. Analysis indicates that an aluminum salt of the dye is formed.—C. E. WHITE and C. S. LOWE. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 430. (E. G. V.)

Aluminum—Quantitative Determination of, by Precipitation with Urea. Aluminum can be accurately separated from large amounts of calcium, barium, magnesium, manganese, cobalt, nickel, zinc, iron, cadmium and copper by precipitation as the dense basic succinate by boiling with urea the acid solution containing succinic acid. Hydrolysis of the urea forms ammonia gradually in a homogeneous solution resulting in a p_H of 4.2 to 4.6. Owing to the dense nature of the precipitate, it is easily filtered and washed and shows much less absorption of other salts than does the precipitate obtained by the usual methods. The basic sulfate precipitate in this way is also dense, but the p_H must be 6.5 to 7.5 and separations in certain cases are less satisfactory. The accuracy of separations made by the urea method is far superior to that obtainable by the use

of ammonia. This is attributed to a combination of four important factors—a dense precipitate, a slow, uniform increase in p_H, a homogeneous solution and a low final p_H.—HOBART H. WILLARD and NING KANG TANG. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 357. (E. G. V.)

p-Amidophenol—Reaction of Vlezenbeek for. The author discusses the actual colored compounds formed in the Vlezenbeek reaction for *p*-amidophenol (*Pharm. Weekblad*, 74 (1937), 127). These, he states, are resorufine and resazurine. Resazurine is formed by the oxidation of resorufine. Formulæ are given for both compounds.—N. SCHOORL. *Pharm. Weekblad*, 74 (1937), 210. (E. H. W.)

p-Amidophenol and Dulcine in Saccharin—New Reaction for. The author has studied the reaction of Ekkert and has applied a modification of this reaction to *p*-amidophenol and *p*-amidophenol derivatives. Two modifications are offered: (1) The material under investigation is heated with resorcin and strong sulfuric acid after which it is made alkaline. This liquid is purplish red in transmitted light and shows a brownish red fluorescence in reflected light. If this solution is then oxidized with iodine solution (or copper sulfate solution) a dark purplish color is formed with the disappearance of fluorescence. The reaction is very sensitive and is especially advantageous in determining dulcine and saccharin in the presence of each other. The latter gives the green fluorescent sulfofluoresceine, which is not apparent before the addition of the iodine. (2) A reaction in which the dark purplish liquid (and not the fluorescent liquid) is obtained directly consists of warming the *p*-amidophenol derivative with strong sulfuric acid to 180°. This sets the *p*-amidophenol free, after which the resorcin is added, the solution made alkaline and finally oxidized with iodine. The application of the test to various specific *p*-amidophenol derivatives is discussed as are also the results obtained with meta- and ortho-amidophenol derivatives. As little as 1/10 mg. of dulcine was detected by the reaction.—H. J. VLEZENBEEK. *Pharm. Weekblad*, 74 (1937), 127. (E. H. W.)

Amines—Aromatic, Tritration of, with Nitrous Acid. A known weight of the purified amine or amine hydrochloride given in Table One was dissolved in 100 cc. of aqueous solution containing 10 cc. of hydrochloric acid (concentrated) in a glass-stoppered Erlenmeyer flask. The sodium nitrite was added, drop-wise, at 20° to 30° C. (not more than 2 cc. per minute) until a test drop immediately turned starch-potassium iodide paper strongly blue. The flask was then stoppered and allowed to stand (with occasional shaking) for 15 minutes. If a test drop of the solution after this time gave only a faint end-point or no end-point, then 2 cc. more of the sodium nitrite solution were added and the procedure was repeated. If, however, a test drop still gave a strong end-point after 15 minutes, the solution was back titrated with standard aniline hydrochloride (0.100*N*) or sulfanilic acid (0.100*N*) solution till only a faint end-point persisted. Because there was usually about 2 cc. excess of sodium nitrate solution for 15 minutes before back-titration, and because nitrous acid is relatively unstable, especially at room temperature, a blank determination was made to determine the amount of sodium nitrite solution lost. The sodium nitrite solution lost in this way was not utilized in the reaction and was therefore subtracted from the total amount of sodium nitrite used. When 2 cc. of (0.110*N*) sodium nitrite solution were added to 100 cc. of aqueous solution containing 10 cc. of concentrated hydrochloric acid, allowed to stand (with occasional shaking) for 15 minutes, and then back-titrated with standard aniline hydrochloride solution, a loss of 0.20 cc. of sodium nitrite solution occurred. When 25 cc. of concentrated hydrochloric acid were used, a loss of 0.23 cc. of sodium nitrate solution occurred.—JOSEPH PHILLIPS with ALEXANDER LOWY. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 381. (E. G. V.)

Arsenic—Determination of, in Mineral Oil Solutions. The sketch for the special Kjeldahl flask set-up is given. A 3- to 5-Gm. sample of the mineral arsenical solution together with 10 Gm. of anhydrous potassium sulfate is placed in the flask A, and the apparatus is assembled. About 20 cc. of concentrated sulfuric acid are then added through the separatory funnel, and the reaction is allowed to proceed until charring occurs. At this point 20 cc. of concentrated nitric are added and heat is applied with a low flame. When the reaction subsides, more nitric acid is added and the heating is continued to gentle boiling, this process being repeated until the solution is clear and of a straw-yellow color. This should take about 2 hours. In general the heating should be so regulated that no undecomposed hydrocarbons pass out of the first condenser. The apparatus is then disconnected. Both the washings from the condensers and the contents from the receiving flask B are transferred to a large beaker. The solution is concentrated on a steam-bath to a low volume and added to the solution in flask A. It is then heated over a wire gauze to fumes of sulfur

trioxide; a few drops of nitric acid are added, and the solution is again heated to fuming, cooled in ice and diluted with water. The solution is now ready for the arsenic determination, which can be carried out by any standard method. The authors, however, prefer to precipitate the arsenic with hydrogen sulfide, oxidize the arsenic trisulfide with hydrogen peroxide, precipitate with ammonium hydroxide and magnesia mixture, filter the precipitate, ignite and weigh as $Mg_2As_2O_7$.—J. B. LEWIS and E. L. BALDESCHWIELER. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 406. (E. G. V.)

Arsenic—Direct Determination of Small Quantities of, in Presence of Mercury. Vitali stated in 1905 that the reduction of arsenite solutions does not take place in the presence of mercury, and the reason attributed was the fact that compounds such as $AsH(HgCl)_2$ and $AsH(HgCl)_3$ are formed. These compounds, however, are easily decomposed by the action of water and heat. The real reason why the mercury prevents the formation of arsine is the formation of a zinc-mercury amalgam which does not readily form molecular hydrogen with ionic hydrogen. If more zinc is added, so that the evolution of hydrogen is increased, then arsine is formed. A modified procedure for carrying out the Marsh test is described. The apparatus is first freed from air and the substance together with 2 Gm. of pure zinc is then treated with 3 times normal sulfuric acid; the escaping gases pass through a hot tube. The reaction is allowed to proceed in the cold at first, but when the evolution of hydrogen slackens, the contents of the flask are heated. When these precautions are taken, there is no difficulty in obtaining 0.013 to 0.21 Gm. of arsenic as mirror in the presence of as much as 2 Gm. of mercury.—J. GANGL and H. DIETRICH. *Mikrochemie*, 19 (1936), 253–261; through *Chimie & Industrie*, 38 (1937), 31. (A. P.-C.)

Arsenic—Quantitative Determination of, in Small Amounts in Biological Materials. The reagents used were: concentrated nitric and sulfuric acids, 70% perchloric acid, 20-mesh zinc, a 75% solution of potassium iodide, commercial hydrogen, approximately 6*N* hydrochloric acid, acid molybdate solution (1 Gm. of $(NH_4)_6Mo_7O_{24}.4H_2O$ per 100 cc. of 5*N* sulfuric solution), and hydrazine sulfate (0.15 Gm. of $N_2H_4.H_2SO_4$ per 100 cc. of aqueous solution). The acid molybdate solution and hydrazine sulfate reagent are mixed in the proportions of 10 cc. of the acid molybdate and 1 cc. of the hydrazine sulfate for each 100 cc. of total solution. The 10 cc. of acid molybdate are diluted to approximately 90 cc. with distilled water before the 1 cc. of hydrazine sulfate reagent is added. The final volume is then made to 100 cc. with distilled water. After thorough mixing, 10 cc. of the above solution are added to each 25-cc. Erlenmeyer flask containing the arsenic pentoxide to be determined. The flasks fitted with glass bulbs are heated for 10 minutes in boiling water, allowed to cool and the colors read in a spectrophotometer. From the readings the quantity of arsenic is determined from a standard curve obtained by treating known amounts of arsenic in exactly the same manner as that described for the unknown digestion mixture. The authors have shown that antimony does not interfere in this determination.—HERMAN J. MORRIS and HERBERT O. CALVERY. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 447. (E. G. V.)

Barium, Sulfur and Sulfates—Determination of. The present method coördinates various well-known analytical procedures. It is based on the fact that the presence of a few ten-millionths of a Gm. of barium ion can be definitely detected by means of a spot reaction on filter paper with a solution of oxybenzoquinone derivatives. By using standard solutions of varying normalities a desired accuracy can be very easily obtained in all practical determinations.—STEPHEN J. KOCHOR. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 331. (E. G. V.)

Benzaldehyde and Formaldehyde—Determination of, by Chloramine. A *N*/10 solution of chloramine is made by dissolving 15 Gm. in 1 liter of water and standardizing by *N*/10 arsenous oxide or sodium thiosulfate. Fifteen to 20 cc. of aqueous solution of benzaldehyde or 0.1 to 0.2 cc. of the technical product is put in a stoppered flask, 4 or 5 cc. of 10% solution of potassium iodide and 50 cc. of *N*/10 chloramine, previously made alkaline with sodium hydroxide, added drop by drop. The mixture is shaken well, left for an hour and a half, acidified with hydrochloric acid and the iodine liberated by the excess of chloramine titrated with *N*/10 sodium thiosulfate. For formaldehyde 5 cc. of a 1% solution is taken, 4 or 5 cc. of potassium iodide solution is added and then 40 to 50 cc. of *N*/10 chloramine drop to bright yellow. The mixture is well shaken, left for fifteen minutes, acidified with hydrochloric acid and the iodine titrated with *N*/10 sodium thiosulfate.—B. CARLI and R. AIROLDI. *Ann. Chim. appl. Roma*, 27 (1937), 56; through *Quart. J. Pharm. Pharmacol.*, 10 (1937), 227. (S. W. G.)

Bismuth—Application of Wet Combustion by Perchloric Acid to the Determination of, in Organic Salts and Pharmaceutical Preparations. The wet combustion of substances containing

bismuth is aided by the use of perchloric acid following treatment with a mixture of sulfuric and nitric acids. The resulting bismuth sulfide is filtered off and washed successively with water saturated with hydrogen sulfide, alcohol, carbon disulfide, alcohol and finally with distilled water. The moist precipitate is transferred to a beaker and dissolved in excess of decinormal silver nitrate. The excess silver nitrate is titrated with potassium thiocyanate or cyanide (Dènigés' method) according as to whether the silver nitrate is acid or neutral. The method can be applied to ointments such as Dermatol (basic bismuth gallate in petrolatum, lanolin, etc.), bismuth powders containing pulverized plant drugs such as belladonna, xeroform (containing bismuth tribromophenate), to mixtures of bismuth salts with inorganic or organic salts in oil suspensions, and to bismuthose (bismuth albuminate). A mixture of 2 Gm. of Dermatol with 4 Gm. of anhydrous sodium sulfate was oxidized by heating with a mixture of 10 cc. of sulfuric acid (specific gravity 1.81) and 5 cc. of nitric acid (specific gravity 1.32); the black reaction product was cooled and a mixture of 2 parts of perchloric acid (specific gravity 1.61) and nitric acid (specific gravity 1.39) was added dropwise until the color disappeared; about 15 to 20 cc. was required. The decomposition was less rapid for ointments containing petrolatum than for those with lanolin or lard.—C. MASINO. *Boll. chim.-farm.*, 75 (1936), 409–415; through *Chimie & Industrie*, 38 (1937), 102. (A. P.-C.)

Bismuth—Microdetermination of. The determination is based on the precipitation of bismuth with potassium iodide as bismuth hydroxyiodate and titration with sodium thiosulfate of the iodine separated by the action of potassium iodide on the precipitate: $2BiOH(IO_3)_2 + 13H_2SO_4 + 26KI = 12I_2 + 2BiI_3 + 13K_2SO_4 + 14H_2O$. The hydroxyiodate is precipitated only in presence of considerable acid. Optimum results are obtained with 100 cc. of the solution containing 20 drops of concentrated nitric acid (p_H about 0.74). Introduce 0.2 cc. of 20% potassium iodate into 5 cc. of the solution in a 6- to 7-cc. sling tube constricted at the bottom to a closed nipple. Triturate the precipitate with a glass rod and wash it off with the potassium iodate solution. Centrifuge (4000 r. p. m.) for 10 to 12 minutes. Remove the supernatant solution with a pipette. Wash the precipitate repeatedly by adding 3 drops of water and centrifuging for 1 or 2 minutes (6 washings are required for 0.01 mg. of bismuth). Introduce 1 cc. of 5% potassium iodide solution and 0.3 cc. of sulfuric acid and stir well with a glass rod. Add 1 drop of starch solution (0.5 Gm. in 100 cc. of saturated calcium chloride solution), and titrate the dark brown solution (caused by the mixture of the blue with the yellow complex ions $K(BiI_4)$ with hundredth-normal sodium thiosulfate to a clear yellow. Because of the slight solubility of the precipitate in the wash waters, the results are calculated not according to the above equation, but that of the empirical coefficient: 0.01 mg. = 0.012 cc. of hundredth-normal thiosulfate. To determine bismuth in plasma, serum, etc., ignite the material in a porcelain dish, dissolve the residue in water with the addition of nitric acid to the required acid concentration and proceed as above.—M. M. KIRILLOV. *J. Prikl. Khim.*, 9 (1936), 932–936; through *Chimie & Industrie*, 38 (1937), 35. (A. P.-C.)

Bismuth—Subiodides of, Preparation and Properties of. Commercial samples of bismuth subiodide were examined and the chemical and physical characters shown to be very varied. Methods of preparation by digesting bismuth subnitrate with potassium iodide and by precipitation were investigated. The oily precipitated form has been prepared, approaching the composition BiOI. It has great covering power, and clinical trial is advocated. Three tables are given, which describe the characteristics of bismuth subiodides from different manufacturers.—N. GLASS. *Pharm. J.*, 139 (1937), 112. (W. B. B.)

Calamine. A study of the analyses of a number of samples of calamine offered on the market to-day leads to the inevitable conclusion that the products sold as calamine are just as variable in composition and uncertain in their action as ninety years ago. A study of calamines being sold to-day reveals the fact that the Codex standard is largely disregarded, and that little progress, if any, has been made during this long period to improve a product which has now almost become a "household medicine." Six different makes of calamine were examined, of which two were specified as Calamina B. P. C. and one was sold under a proprietary name but was definitely offered as a substitute for calamine. In each case a fairly comprehensive chemical analysis was carried out, and further tests were applied in order to compare the physical characteristics as regards density and also as regards suspension in water. Only two of the six samples examined conform to the requirements of the 1934 Codex, and both of these were relatively light in density, which would render them suitable for the preparation of ointments, owing to increased covering power. These two also compared very favorably with the non-B. P. C. samples in a suspension

test, which would indicate suitability for use in lotions. From a study of tabulated figures given by the author it is difficult to find any justification for the use of non-B. P. C. material.—B. F. HOWARD and F. E. CARTER. *Pharm. J.*, 139 (1937), 51. (W. B. B.)

Calcium Sodium Lactate—Assay of. Calcium Sodium Lactate, B. P. C., was examined by the author. According to the formula, $(C_3H_5O_3)_2Ca$, $2(C_3H_5O_3)Na$, $4H_2O$, there should be 14% of water, but the Codex states "Loss on drying at 130° C., not more than 16%" and that it melts when heated above 100° C. The author found that samples of the Codex salt melt at approximately 105° C., but that another product on the market melts sharply at 79° C. The percentage of water was found to be 13.7 in the case of the Codex salt, while the water content of the other product was found to be 22.9%. Other differences were also found. The author suggests a simpler method for assay of the calcium, namely, by treating the residue with concentrated sulfuric acid and after ignition weighing as calcium sulfate. The following method was suggested for the assay of sodium in calcium sodium lactate: To the substance (containing between 5 and 10 mg. of sodium dissolved in 5 to 10 cc. of water or alcohol) add 3 cc. of reagent for each mg. of sodium expected. Place beaker in ice-cold water and stir occasionally with a glass rod during half an hour. Filter through a sintered glass crucible and wash with 5 to 10 cc. of reagent followed by 5 to 10 cc. of alcohol (95%). Dry between 105° and 110° C.; 1 Gm. of triple salt is equivalent to 0.0153 Gm. of Na. The method is useful for the determination of sodium bromide in the presence of six times its weight of potassium bromide.—S. G. LIVERSEDGE. *Pharm. J.*, 139 (1937), 113. (W. B. B.)

Carbon Monoxide—New Device for the Detection and Determination of, in the Field by the "Blood" Method and Determination of the Toxicity Value. The previously described apparatus (*Pharm. Abs.*, 2 (1936), 140) furnished the means of determining total combustible gases, but not carbon monoxide separately. There is now described a portable apparatus (constructed by Arca, Paris) for determining carbon monoxide in the air by removing oxygen (with sodium hyposulfite and sodium hydroxide), passing the de-oxygenated air through a 1% solution of hog or guinea-pig blood and examining the latter spectroscopically. Details of the technic are given. The method is sensitive to 1 in 200,000. Carbon dioxide can also be determined with the same apparatus using two additional attachments, and hence the toxicity value (CO/CO_2) can be calculated.—KOHN-ABREST. *Ann. fals.*, 30 (1937), 263–276. (A. P.-C.)

Cinchona—Assay of. The method recommended is as follows: 2.5 Gm. of finely powdered cinchona bark is warmed for ten minutes with 5 cc. of dilute hydrochloric acid and 20 cc. of water. After cooling, the mixture is treated with 25 Gm. of chloroform, followed by 50 Gm. of ether. The mixture is shaken thoroughly, mixed with 5 cc. of sodium hydroxide (1 + 4) and shaken again for ten minutes. Two grams of powdered tragacanth are added, and the liquid is strained through cotton wool. The residue from the evaporation of 60 Gm. of the filtrate is evaporated down with 10 cc. of absolute alcohol, and then dissolved in 20 cc. of alcohol. Twenty cc. of water, 5 drops of methyl red solution and 2 drops of methylene blue solution are added, and the mixture is titrated with $N/10$ hydrochloric acid. The alkaloid is calculated as an equimolecular mixture of cinchonine and quinine, *i. e.*, 1 cc. of $N/10$ acid is equivalent to 0.0309 Gm. of alkaloids.—A. JERMSTAD. *Norsk farm. Tidsskr.*, 44 (1936), 302, 309, 323; through *Quart. J. Pharm. Pharmacol.*, 10 (1937), 228. (S. W. G.)

Cinchonine Hydriodide—Reagent for Bismuth. Cinchonine hydriodide is not a specific reagent for bismuth. The metals of the first and second analytical groups interfere with the reaction, both in neutral and sulfuric acid solution. Interference is also caused by trivalent chromium, selenious acid and nitrites, and by metals forming insoluble sulfates, such as barium, when the test is carried out in sulfuric acid solution. In general the interference is more marked in neutral solution than in sulfuric acid solution. The reaction of cinchonine hydriodide with bismuth is extremely sensitive; in the absence of the above-mentioned substances it can be used to detect as little as 1 part of bismuth in 1,000,000 parts.—J. B. FICKLEN, I. L. NEWELL and N. R. PIKE. *Z. anal. Chem.*, 30 (1936), 104; through *Quart. J. Pharm. Pharmacol.*, 10 (1937), 229. (S. W. G.)

Copper—Comparison of Quantitative Methods for the Determination of. Samples of chalcocite and of copper sulfide were analyzed by weighing copper-thiocyanate, weighing an electrolytic deposit of copper and by titrating with sodium thiosulfate. In the volumetric method, the solution was treated with 10 cc. of $6N$ sulfuric acid, evaporated to fumes, treated with 20–40 cc. of water and then treated with 25 cc. of $6N$ acetic acid and 12 cc. of $6N$ ammonium hydroxide or with 1 Gm. of ammonium bifluoride for every 0.1 Gm. of iron present. The volumetric methods

are always a little low and iodofluoride method fails if more than 0.15 Gm. of iron is present.—H. W. FOOTE and JOHN E. VANCE. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 205. (E. G. V.)

Coumarin and Melilotic Acid—Determination of. A rapid microcolorimetric procedure for the separate estimation of coumarin and melilotic acid in sweet clover (green and seed tissue) is presented. The procedure is based on the production of red dye produced by coupling coumarin and melilotic acid with a diazotized solution of *p*-nitroaniline. The method is suitable for routine assay work in genetical studies involving the examination of a large population of green or seed tissue and requires samples of only a few mg. A significant feature of the method is the inclusion of a suitable incubation period (one hour at 40°) for the enzymatic release of bound coumarin prior to the extraction. All heretofore reported analyses on the coumarin content of green sweet clover or viable seed tissue are inaccurate, since allowance has not been made for the bound coumarin which is readily released by enzymatic action.—WILLARD L. ROBERTS and KARL PAUL LINK. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 438. (E. G. V.)

Coumarin in Vanilla Extract—Determination of. Approximately 12.5 cc. of the vanilla extract together with 2 cc. of concentrated sulfuric acid or 0.5 Gm. of one of the salts were placed in the one liter, long-necked, round-bottomed, Pyrex distillation flask. A definite amount of pure coumarin was added and the volume was diluted to approximately 100 cc. with distilled water. The flask was then fitted with a Kjeldahl distillation bulb and a steam inlet tube which extended almost to the bottom of the flask. The distilling flask was joined through the connecting bulb to a 63-cm. 12-bulb Allihn condenser and immersed in a boiling water-bath. A 4-liter Pyrex beaker served as a transparent bath through which the steam distillation was observed and controlled. A 1-liter suction flask fitted to the condenser collected the distillate. The entire system was connected to a water suction pump by rubber tubing attached to the side tube of the suction flask. A mercury manometer inserted in the line measured the pressure. It is convenient to run the distillations in duplicate by attaching two sets of apparatus to the same suction pump and to the same steam jet. A stream of dry steam was passed into the flask until the contents reached a vigorous boil and the distillate began to drip from the condenser. The pressure was then reduced rapidly, but at such a rate as to prevent boiling over, until the pressure in the system was 140 mm. or mercury. This was conveniently controlled by placing a screw clamp on a rubber tube which was connected to the system by means of a Y-tube. The distillation was continued at this rate until the flask was dry, after which it was removed from the bath. An additional 100-cc. portion of water was added to the contents of the flask and the distillation procedure was repeated, after which the condenser was rinsed down into the receiving flask and the distillate transferred to a 1-liter volumetric flask. The flask was made up to volume and 20-cc. aliquots of the distillate were pipetted into 50-cc. volumetric flasks. Five cubic centimeters of 2% sodium carbonate solution were added to each flask and the contents were heated in a boiling water-bath for 5 to 10 minutes or, if more convenient, heated in a water-bath at 80° C. for 15 minutes. The flasks were cooled to room temperature, 5 cc. of cold diazonium solution were added, and the flasks were made up to volume. A series of standards containing from 0.0001 to 0.001 Gm. of coumarin was prepared at the same time and in the same way as the unknown solutions. Color comparisons were made in a colorimeter after standing for 15 minutes. The diazonium solution is made as follows: (A) *p*-nitroaniline hydrochloride (3.5 Gm. of *p*-nitroaniline dissolved in 45 cc. of concentrated hydrochloric acid, diluted to 500 cc. with distilled water, and filtered). (B) Sodium nitrate (5 Gm. dissolved in 100 cc. of distilled water. This solution should be kept away from light and renewed frequently. It will be kept for a month or longer if placed in a refrigerator at 0° to 3° C.). Stock solutions (A) and (B) were stored in an electric refrigerator at 0° to 3° C. Five cc. of each solution were placed in a cold 100-cc. volumetric flask and kept in a refrigerator for at least 5 minutes. To this, 10 cc. of solution (B) were added, and the flask was shaken and returned to the refrigerator for 5 minutes more. The solution was then diluted to 100 cc. with ice-cold distilled water, shaken and allowed to stand in the refrigerator for 15 minutes before using. The solution should be kept cold and should be renewed every 24 hours.—I. J. DUNCAN and R. B. DUSTMAN. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 416. (E. G. V.)

Drugs—Contributions to the Examination of. II. Analytical procedures are outlined for calcium gluconate, dry magnesium chloride, magnesium peroxide and urethane.—KONRAD SCHULZE. *Apoth. Ztg.*, 52 (1937), 943–945. (H. M. B.)

Drugs—Methods of Preparation of, for Inclusion in Brazilian Pharmacopœia. A discussion

of derivation and extraction from *Digitalis purpurea* of digotoxin, and the glycosides of *Digitalis lanata*. Provides for colorimetric tests and biological assay on frogs. Lists various ergot derivatives including lipoids, amino acids and alkaloids from ergotimine of Tanret 1875 to ergostetrine of Thompson 1935. Provides for chemical analysis and biological tests including cockscomb, arterial pressure, uterus *in situ* and isolated. Of chenopodium, lists official preparations providing for chemical analysis.—MILITINO C. ROSA. *Revista de Quimica y Farmacia, Rio de Janeiro*, 2 (1937), 33. (G. S. G.)

Extractum Ferri Pomata—Determination of Di- and Tri-valent Iron in. The author offers the following method for the determination of di- and tri-valent iron in Extractum Ferri Pomata: Dissolve about 2 Gm. of the extract (in a flask with a glass stopper) in 10 cc. of 10% hydrochloric acid and 20 cc. of water. Sprinkle 0.5 Gm. potassium rhodanide in the mixture, add 20 cc. ether and titrate the ferric iron in the two-phase system of ether-water with $N/10$ titanium chloride. The end-point is reached when the ether layer just becomes clear. Add bromine in slight excess and then remove the excess bromine with 5% phenol solution; add 0.5 Gm. potassium rhodanide again and titrate the total iron with titanium chloride.—L. SZEBELLÉDY. *Ber. Ung. Pharm. Gesellsch;* through *Pharm. Weekblad*, 74 (1937), 612. (E. H. W.)

Fructose—Determination of, with Selenious Acid. Sugars containing a keto group reduce selenious acid to selenium, and under specified conditions the reaction may be used for the determination of fructose or sucrose in presence of aldoses. The reagent is prepared by dissolving 0.2000 Gm. of selenious acid in 50 cc. of water; 10 cc. of concentrated sulfuric acid is added, and after cooling, the liquid is made up to 100 cc. Five cc. of a solution containing 1% of fructose and 5 cc. of water are placed in a 100-cc. conical flask with ground neck, 10 cc. of the reagent and a fragment of pumice are added, and a reflux condenser is attached. The mixture is heated at such a rate that boiling commences after three minutes, and is continued for exactly one hour. The gas is turned out and, after three minutes, the condenser is washed down with 10 cc. of boiling water. The contents of the flask, with the pumice, are filtered on a porcelain filter crucible, which is then washed with 200 cc. of boiling water. The fragment of pumice is removed with tweezers and rinsed with a little water. Finally the residue is washed with 10 cc. of alcohol, and 10 cc. of ether and dried for one hour *in vacuo* over phosphorus pentoxide. Under these conditions 0.1 Gm. of pure fructose gives 0.0076 Gm. of selenium, while 0.1 Gm. of saccharose gives 0.0048 Gm. of selenium.—G. REIF. *Z. Unters. Lebensm.*, 73 (1937), 20, through *Quart. J. Pharm. Pharmacol.*, 10 (1937), 230. (S. W. G.)

Glycochol and Serin—Determination of. The author describes the method employed in the determination of glycochol and serin. The method depends primarily on the oxidation of glycolic acid and glycerinic acid to oxalic acid when an alkaline solution of permanganate is used. The following results were obtained: 40.23% of fibroin, 31.82% elastin, 26.45% gelatin, 8.18% casein, 7.91% sericin and 4.42% edestin. The amounts of elastin, edestin and sericin which were actually obtained are usually higher than those which were given here. The amount of gelatin obtained is the highest ever obtained, however the quantity of casein is the lowest ever obtained. The author reports attempts which were made to ascertain the amount of sericin by reducing it to alanin with hydriodic acid. The presence of alanin caused difficulties when an attempt was made to remove it. Furthermore, the author attempted a colorimetric determination for glycerinic acid, which depends on the blue color obtained when naphthoresorcin in concentrated sulfuric acid is added. Using this method of determination for sericin the results obtained were: 8.71% serin and 1.69% glycochol.—S. RAPOPORT. *Biochem. Z.*, 30 (1935), 281, through *Chem. Zentralb.*, 107 (1936), 1277. (G. B.)

Guanidine-Like Substances—Colorimetric Estimation of, in the Urine. A modification of Weber's method is described, whereby the guanidines adsorbed on norite are eluted with boiling acid alcohol instead of cold alcohol. The method gives 85% recovery of methylguanidine added to urine. The final extract is practically colorless. In the presence of creatinine ca. 0.7% is determined as guanidine, but this proportion varies with the concentration of creatinine. The guanidine-like substances excreted by four normal men amounted to 3–10 mg. per 24 hours.—J. E. ANDES and V. C. MYERS. *J. Biol. Chem.*, 118 (1937), 137–145, through *Physiol. Abstr.*, 22 (1937), 663. (F. J. S.)

High Vacuum and Its Uses for the Distillation and Crystallization in Technical Operations. A discussion with illustrations.—TH. HINKO. *Riechstoff-Ind. Kosmetik*, 12 (1937), 117–120. (H. M. B.)

Hydrastis—Assay of. Comparative assays of samples of hydrastis root and fluidextract by various pharmacopœial methods gave the following results:

Method.	Per Cent Hydrastine. Individual Assays.	Mean Result.
Hydrastis rhizome		
Norwegian IV	2.34, 2.27, 2.22	2.27
German VI	2.58, 2.60	2.59
Swiss V	2.58, 2.35	2.47
Dutch V	1.95, 1.84	1.90
Hungarian	2.25, 2.00, 2.28, 2.09	2.13
Fluidextract of hydrastis		
Norwegian IV	2.62, 2.58	2.60
German VI	2.28, 2.28, 2.25, 2.30	2.28
Swiss V	2.36, 2.33, 2.34	2.34
Dutch IV	1.96, 1.96	1.96
Swedish X	2.07, 2.09	2.08

A. JERMSTAD. *Norsk farm. Tidsskr.*, 44 (1936), 325, 339; through *Quart. J. Pharm. Pharmacol.* 10 (1937), 231. (S. W. G.)

Hyoscyamus—Assay of. The following method of assay avoids the difficulty, found with the German official method, of titrating highly colored solutions. Six grams of extract of hyoscyamus is dissolved in 5 cc. of warm water. After cooling, 30 Gm. of ether is added, followed by 2 Gm. of ammonia. After shaking for five minutes, 1 Gm. of powdered tragacanth is added and the ethereal solution is strained off through cotton wool. Twenty grams of this solution is evaporated to dryness, the residue is dissolved in 10 cc. of ether, 25 cc. of 0.25% hydrochloric acid is added, and the ether is evaporated off. The weight is then made up to 28 Gm. with 0.25% hydrochloric acid. After the addition of 0.5 Gm. of talc, the liquid is filtered; 21 Gm. of the filtrate being made alkaline with ammonia and shaken out three times with chloroform. The chloroform is removed by evaporation, the residue dissolved in 2 cc. of alcohol, 5 cc. of water is added and the mixture is titrated with $N/100$ hydrochloric acid, using methyl red as indicator. For hyoscyamus leaf the same method is used, taking 20 Gm. of ether and 7 Gm. of ammonia.—A. JERMSTAD. *Norsk farm. Tidsskr.*, 44 (1936), 345, 356; through *Quart. J. Pharm. Pharmacol.*, 10 (1937), 232. (S. W. G.)

Iodine—Determination of, in Meditreen, Iodo-oxyquinolinsulfonic Acid, Iodochloroquinolin, etc. The author finds that the (Dutch) Pharmacopœial method for the determination of the iodine content of meditreen gives results which are too low. He suggests the following method: Dissolve 250 mg. of meditreen in 25 cc. of water; add 50 cc. of potassium permanganate (1–25) and 25 cc. diluted sulfuric acid; boil the mixture 5 minutes, cool and add an excess of powdered sodium bisulfite so that a clear colorless liquid results; then add 10 cc. of $N/10$ silver nitrate and 25 cc. of nitric acid; boil, cool and titrate the excess silver nitrate with $N/20$ ammonium sulfocyanide. For the determination of iodine in iodo-chloro-oxyquinoline the following method is suggested: Dissolve 120 mg. iodochloro-oxyquinoline in a mixture of 25 cc. of water and 1 cc. of sodium hydroxide solution; add 50 cc. of potassium permanganate (1–25) and 25 cc. of diluted sulfuric acid; boil until no more chlorine is evolved (potassium iodide paper); cool and add an excess of sodium bisulfite (fine powder) so that a clear colorless solution is obtained, then add 10 cc. of $N/10$ silver nitrate and 25 cc. nitric acid (50%); boil, cool and titrate back with $N/20$ ammonium rhodanate (Volhard). A method is also given for the determination of chlorine in iodo-chloro-oxyquinoline.—J. C. DEJONG. *Pharm. Weekblad*, 74 (1937), 608. (E. H. W.)

Iodine—Solutions of, Assay of. A method is proposed for the assay of solutions of iodine and similar solutions, as follows: To 5 cc. of a solution of potassium iodide, 5 cc. of 10% potassium cyanide solution and 10 cc. of hydrochloric acid were added, and the solution, diluted to 150 cc. in a long-necked flask, was titrated with $M/40$ potassium iodate, using starch mucilage as indicator. Excess of potassium iodide was then added and the liberated iodine titrated with $N/10$ sodium thiosulfate. One cc. contains 0.0155 Gm. of iodine. The method may be applied to the determination of free iodine, combined iodine and total iodine in simple solution of iodine

B. P., and for the determination of free iodine in potassium iodide, in weak solution of iodine, strong solution of iodine and aqueous solution of iodine. For aqueous solution of iodine the appropriate formula should be modified by multiplying by the factor $\frac{166}{126.9}$.—C. MORTON and F. R. C. BATESON. *Pharm. J.*, 139 (1937), 196. (W. B. B.)

Ipecacuanha—Assay of. Comparison of a number of methods for the assay of ipecacuanha showed the following to be the most satisfactory. Three grams of the powdered root is extracted for half an hour with a mixture of 30 Gm. of ether and 3 Gm. of ammonia. The ethereal solution is filtered through cotton wool, and 20 Gm. of the filtrate evaporated to dryness. The residue is dissolved in 2 cc. of alcohol, 20 cc. of water is added and the solution is titrated with $N/10$ hydrochloric acid, using a mixture of two drops of methyl-red solution and 1 drop of methylene-blue solution as indicator. One cc. of the acid is taken as equivalent to 0.0245 Gm. of ether-soluble alkaloids. In the case of the concentrated infusion of ipecacuanha, 30 Gm. is evaporated to 7.5 Gm. and extracted with 30 Gm. of ether and 3 Gm. of ammonia, and 1 Gm. of powdered tragacanth is added before filtering, 20 Gm. of the filtrate being taken as before.—A. JERMSTAD. *Norsk farm. Tidsskr.*, 44 (1936), 358, 388; through *Quart. J. Pharm. Pharmacol.*, 10 (1937), 234. (S. W. G.)

Lavender and Other Oils—a Study of the Analysis of. The production of oil of lavender in France is described; its composition and adulteration are briefly discussed. A method of analysis is proposed, which is claimed to be capable of detecting adulteration with practical certainty. It comprises: (1) determination of the residue on evaporation of the water-bath; (2) determination of the refractive index of fractions obtained by fractionation under vacuum; (3) determination of ketones in the various fractions; (4) identification of the ketones (*e. g.*, by determining the melting points of the semi-carbazones prepared either directly from the oil or from the total ketones extracted by Girard's and Sandulesco's methods). Camphor was never found by the author in lavender oils of known purity, but exists in large quantities in oils of lavandin, spike lavender and Shiu, which are used for adulterating lavender oil. The methods are described in detail, and the results of numerous analyses of pure and commercial oils are presented in a number of tables (given as a separately paged appendix).—J. RIPERT. *Ann. fals.*, 30 (1937), 217–225, 276–288. (A. P.-C.)

Magnesium in Milk Products. Determination by a Micro-Method. The method is a modification of that of Tischer, involving precipitation of the magnesium as $MgNH_4PO_4.6H_2O$ (from a solution of the ashed material), followed by a colorimetric determination of the phosphate in the precipitate by a molybdate method.—J. H. BUSHILL, L. H. LAMPITT and D. F. FILMER. *J. Soc. Chem. Ind.*, 56 (1937), 411T. (E. G. V.)

Medicinal Substances—New, Constants and Properties of. A part of a series of monographs prepared by the group of hospital and municipal pharmacists (Holland). The monographs in this list include amygdalic acid; dihydrocodeine bitartrate; dihydrococaine dihydrochloride; dihydromorphinone hydrochloride; quinine lactate, powdered tin and pyrogallol triacetate.—*Pharm. Weekblad*, 74 (1937), 571. (E. H. W.)

Mercurimetry. I. Determination of Halogens. Into an Erlenmeyer flask pour 25 cc. of decinormal solution of the chloride or bromide to be determined, add 1 cc. of twentieth-normal ammonium thiocyanate and 2 to 3 cc. of concentrated ferric nitrate solution and titrate the red solution with decinormal mercurous nitrate to complete decolorization. At the same time run a blank to determine the amount of mercurous nitrate corresponding to the amount of indicator used. For iodides, add 25 cc. of decinormal mercurous nitrate to 25 cc. of the solution to be analyzed, filter off the precipitated mercurous iodide, wash with water slightly acidified with nitric acid, oxidize the excess of mercurous nitrate with potassium permanganate and destroy the excess of the latter with ferrous sulfate. Titrate the mercuric nitrate formed by means of ammonium thiocyanate, and calculate by difference the mercurous nitrate used to precipitate the iodide ion.—M. CHTCHIGOL. *J. Prikl. Khim.*, 9 (1936), 946–949; through *Chimie & Industrie*, 38 (1937), 35. (A. P.-C.)

Microcrystalline Objects—Some Curious. The author discusses various microchemical reactions and describes the resulting crystals both as to constants and properties. Among the reactions described is the nitric acid reaction for dulcine. He also describes a series of products obtained by allowing substances to melt between slide and coverglass and then cooling. These

are divided into (1) those which remain liquid such as salol and those (2) which become solid on cooling. The latter group may again be subdivided into (*a*) those where crystallization does not accompany solidification and where an isotrope is formed (to this group belong the barbiturates, luminal, proponal and evipan: dial, rutonal and veronal crystallize directly); (*b*) those where the isotrope remains glassy but crystallization takes place after a relatively short time (santonin) and (*c*) those where crystallization takes place directly. The nitro-products of antipyrine and tyrosine are also discussed. Photomicrographs are given for nitro-dulcine, dial melt, bromural melt, phytosterine melt, ergosterine melt, cholesterine melt, adaline melt, nitro-antipyrine and nitro-tyrosine.—C. VAN ZIJP. *Pharm. Tijdschrift*, 14 (1936), 81. (E. H. W.)

Molybdic Derivatives—Qualitative and Quantitative Determinations with. Various molybdic reagents may be used to give a qualitative or quantitative color reaction with dimethyl-aminoantipyrine and morphine. The phosphotungstomolybdic or arsenotungstomolybdic reagents are preferred for quantitative determinations because they are more sensitive and give more stable colorations than phosphomolybdic or arsenomolybdic acids. The silicomolybdic reagent has been found to give an excellent qualitative reaction with morphine. Phosphotungstomolybdic reagent is exact and sensitive and does not present the inconveniences of various other reagents. Arsenic acid or its salts may be determined as follows: Bring to a boil a mixture of 2 cc. of 15% sodium molybdate solution and 2.5 cc. of a reducing agent (1 Gm. hydroquinone and 8.5 Gm. sodium sulfite in 90 cc. of water). Add about 1 cc. of the arsenical solution, 1.6 cc. of 10% sulfuric acid and 0.2 cc. of 5*N* nitric acid measured exactly. A blue-green color changing to dark blue is formed. Without the reducing agent a yellow arsenomolybdic compound is formed, the intensity of the coloration being in proportion to the concentration of arsenic. Compare with prepared standards. *Determination of Silicon.*—Reagent: 4.3 cc. of 5% sodium molybdate, 4.3 cc. of 2.5% cocaine hydrochloride, 11.4 cc. of 96% acetic acid. Method: Add 4 cc. of reagent to 6 cc. of sample. With soluble silicates the turbidity appears almost instantaneously and attains a maximum after 2–3 minutes. The opalescence is proportional to the quantity of silicon. The reaction will detect 0.0005 mg. of silicon in 10 cc. of liquid. Fluorine may be determined after separation as silicon tetrafluoride.—H. WACHSMUTH. *J. pharm. Belg.*, 19 (1937), 575–577, 593–595, 609–613, 627–631. (S. W. G.)

Morphine—Colorimetric Determination of Small Quantities of. The author discusses the method of Hofmann and Popovici (*Pharm. Zentralhalle* (1935), 346) in which morphine is determined colorimetrically by the use of a silicomolybdic reagent. Careful determinations were made with the aid of the Stufenphotometer. The author points out that due to the rapid disappearance of color, readings must be made punctually. Other undesirable features of the method are also discussed.—C. G. VAN ARKEL. *Pharm. Weekblad*, 74 (1936), 134. (E. H. W.)

Morphine—Notes on the Colorimetric Determination of. The B. P. colorimetric determination of morphine can be made more accurate and the colors more easily matched by "compensating" the blank solution, after making ammoniacal, with a quantity of the test solution equal to that used in the test. The necessity for "compensation" is clearly demonstrated by the fact that the extracted alkaloidal residue will give a brown color with ammonia without the addition of nitrite. This modification was found necessary for all the colorimetric determinations of morphine investigated in complex galenicals. Aromatic powder of chalk and opium (the B. P. preparation) requires a further modification of the technic. The ipecac in powder of ipecacuanha and opium (B. P.) does not interfere with the morphine determination. Application of the general method to gall and opium ointment (B. P.) and tincture of chloroform and morphine (B. P.) is possible.—D. C. GARRATT. *Pharm. J.*, 139 (1937), 193. (W. B. B.)

Mustard Gas Reactions—Comparative Studies of. (1) Those reactions described in the literature as giving the best results for the detection of mustard gas in the field were studied comparatively. It was found that the specific gold chloride reaction of Obermiller used in the manner described by the author was the most sensitive reaction for mustard gas. Its sensitivity is not surpassed by those reactions valued for their sensitivity but not for their specific character. The reaction is much more sensitive than that of Dräger-Schröter. (2) The reaction with Sudan paper is explained. Like the decolorized powders, this reaction is a simple but not a specific aid in the detection of mustard gas. (3) A plan is suggested for the determination and detection of mustard gas. (4) It is stated that the reaction with potassium permanganate, while not specific,

is nevertheless a convenient reagent to ascertain the absence of mustard gas and arsenates in drinking water.—I. H. L. LIGTENBERG. *Pharm. Weekblad*, 74 (1937), 185. (E. H. W.)

Nitrates—Colorimetric Determination of. Small quantities of nitrates react with α-naphtholsulfonic acid to form an intensely yellow compound (probably naphthal yellow) after alkalinizing the solution. The reagent is prepared by heating 20 Gm. of α-naphthol with 200 cc. of concentrated sulfuric acid on a water-bath. This reagent may be used to replace phenolsulfonic acid in the colorimetric determination of nitrogen as nitrate. Prepare standards by evaporating to dryness 25 cc. of a solution containing 0.01 mg. of nitrate per cc. and adding 2 cc. of the reagent. After 15 minutes, dilute the solution and add 8 cc. of 10*N* sodium hydroxide. Dilute to 250 cc. and compare different volumes with the unknown in a Duboscq colorimeter.—G. V. L. N. MURTY and G. GOPALARAO. *Z. anorg. allgem. Chem.*, 231 (1937), 181; through *J. pharm. Belg.*, 19 (1937), 703. (S. W. G.)

Opium—Determination of Morphine in. The results obtained by the author with the method proposed by the League of Nations are quite variable. The following method is recommended: Dry a representative sample of opium in an oven at 60° C., reduce to a powder and place in the oven for another 3 hours. Mix 10 Gm. of the dried powdered opium and 4 Gm. of finely powdered calcium hydroxide in a mortar with enough water to make a homogeneous paste. Add 25 cc. of water, transfer completely to a calibrated 100-cc. flask with the aid of water. Add 6 cc. of water and shake frequently during 2 hours avoiding the formation of a foam. Make up to volume and filter through a plaited filter. Transfer 50 cc. of the filtrate to a conical 100-cc. ground-glass stoppered flask, add 10 cc. of ether, mix by careful rotation, add 1 Gm. of pure ammonium chloride, rub the wall of the flask with a glass rod until a precipitate appears at that point. Stopper, let stand for 24 hours, decant, filter the ether through a dry tared filter. As soon as the ether has passed through, pour the aqueous liquid on the filter. Wash the morphine by decantation, transfer the crystals to the filter and continue the washing until no turbidity is formed on addition of silver nitrate in nitric acid medium. Dry at 100° C. for 2 hours; cool, pour on the filter containing the crystals 10 cc. of ether, then 24 cc. of benzin in 3 portions. Dry in the air and then in an oven at 100° C. for 2 hours. Cool in a desiccator and weigh. Wash the filter with 75–100 cc. of boiling 95% alcohol until no residue remains on evaporation. Dry the filter and residue in an oven at 100° C. for 1 hour, cool, weigh and subtract the result from the first weight obtained. The difference in weight multiplied by 20 gives the percentage of morphine.—CARLOS COUTINHO. *J. pharm. Belg.*, 19 (1937), 645, 661, 679. (S. W. G.)

Paraffin—Medicinal, British Pharmacopœia Test for. "The Addendum to the British Pharmacopœia, which became official in January 1937, describes the sulfuric acid color test for liquid paraffin, but the standard color glasses are given in terms of the measurement adopted at the National Physical Laboratory, Teddington, which are not readily transferable to the Lovibond scale. The limit specified in the test corresponds with a combination of Lovibond glasses, 2.5 red, and 6.5 yellow."—THE TINTOMETER LIMITED. *Analyst*, 62 (1937), 457. (G. L. W.)

Perfume Materials—Extraction of, by Volatile Solvents. V. The composition and analysis of extraction products. A review.—Y. R. NAVES. *Riechstoff-Ind. Kosmetik*, 12 (1937), 137–139. (H. M. B.)

Perfumes—Analysis of, by Extraction with Steam. The apparatus permits of separating the volatile fraction of concrete essential oils by entrainment with superheated steam under reduced pressure. The operation is carried out under a pressure of 30 to 35 mm. of mercury and requires 20 to 40 minutes. The distillate is extracted with petroleum ether boiling at 45° to 50° C. —Y. R. NAVES. *Documentation Sci.*, No. 50 (Dec. 1936), 303; through *Parfums de France*, 15 (1937), 68. (A. P.-C.)

Perfumes—Natural, Analysis of. Analytical knowledge of natural perfumes, artificial technic for the odoriferous fraction, interpretation of results of analysis are discussed in detail.—Y. R. NAVES, S. SABETAY and L. PALFRAY. *Perfumery Essent. Oil Record*, 28 (1937), 327. (A. C. DeD.)

Phosphoric Acid—Esters of. III. Phosphorylaminoethanol and Phosphorylcholine. Phosphorylaminoethanol and phosphorylcholine were prepared (1) by the action of phosphoryl chloride on the bases, (2) by the action of phosphoric acid plus phosphorus pentoxide on the bases, and (3) by the action of ammonia or trimethylamine on chloroethylphosphoryl chloride. Isolation was usually effected as the barium or calcium salts; phosphorylaminoethanol can also be

isolated as the ammonium salt. The other salts of these esters are soluble in water. The free esters were prepared from the salts; they are hydrolyzed by heating with *N* hydrochloric acid, but are stable to *N* sodium hydroxide at 100° C. The phosphatases of bone, kidney and intestine effect their hydrolysis. On heating with dilute alkali phosphorylchloroethanol is rapidly changed into phosphorylhydroxyethanol. The halogen in ethylene chlorohydrin, chloroethylphosphoryl chloride and phosphorylchloroethanol is best estimated by evaporating the solution with aqueous potassium hydroxide and determining the chloride by Volhard's method.—R. H. A. PLIMMER and W. J. N. BURCH. *Biochem. J.*, 31 (1937), 398–409; through *Physiol. Abstr.*, 22 (1937), 571. (F. J. S.)

Phosphorus—Interference of, in the Determination of Fluorine. It has been known that phosphates interfere with the colorimetric determination and with the thorium nitrate titration of fluorine but it has been thought that the Willard-Winter distillation method made a complete separation of fluorine from phosphate. In determining the fluorine content in foods, values as much as 11 parts per million too high were obtained as a result of the carrying of some phosphoric acid over in the perchloric acid distillation. The error can be prevented by double distillation. First distil with sulfuric acid and distil a second time with perchloric acid at 135°. The foods tested contained from less than 0.2 to 220 parts per million.—H. V. CHURCHILL, R. W. BRIDGES and R. J. ROWLEY. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 222. (E. G. V.)

Phytochemistry. What It Is and How It Has Developed. The detection, isolation and estimation of plant components is discussed, together with explanations of certain plant processes. Some present-day problems in phytochemistry are summarized.—R. C. BURRELL. *J. Chem. Educ.*, 14 (1937), 520. (E. G. V.)

Radium—Use of a Geiger-Mueller Counter for Detecting Small Amounts of, Stored in Radium Workers. An account of technic and report of a preliminary investigation which indicated that amounts of radium in clothing, etc., are larger than had been expected. It is suggested that radium absorption does occur to a significant extent and is a contributory cause of an anemia which occurs in radium workers.—E. O. BRAATEN and J. D. LEITCH. *J. Ind. Hyg.*, 21 (1937), 193–197; through *Physiol. Abstr.*, 22 (1937), 735. (F. J. S.)

Snake Poisoning and Malaria—General Investigation of, Plant Used by Indians in. According to ancient American Indian tradition "Chalchupa" has been regarded as a specific in the treatment of snake-bite poisoning. The plant was identified by Don Marino Pacheco Herarte as *Rauwolfia heterophylla* (*Apocynaceæ*). A macroscopic description and two photographs of the plant are given. Quantitative analyses of various parts of the plant, *viz.*, the roots, twigs, leaves, blossoms and berries are tabulated. Two alkaloids were isolated from an extractive of the powdered roots or leaves obtained with a 1% tartaric acid solution in alcohol. The one, chalchupine A, existing to the extent of 4–5% in the roots, has the formula $C_{14}H_{21}N_3O_{12}$ and melts at approximately 170° C. It has an extremely bitter taste and gives a very strong greenish yellow fluorescence. It is light sensitive (reddens), slightly soluble in water (yellowish solution), easily soluble in alcohol, less so in amyl alcohol, chloroform and mineral acids, and but slowly soluble in ether. With nitric acid it affords a positive reaction for brucine, but does not show the typical brucine reaction on the further addition of tin chloride solution. Typical reactions of the alkaloid with concentrated sulfuric acid, Froehde's reagent and Erdmann's reagent are given. Further extraction and repeated purification yielded a resinous phenolic residue for which elementary analysis indicated the formula $C_{72}H_{129}O_{71}N_{12}S$. The isolation of a simpler base, $C_{15}H_{24}O_{11}N_6$, designated chalchupine B, from the latter suggests that it may not have been a pure compound. B is very similar to A, exhibiting the same greenish yellow fluorescence in solution. B, however, gives no characteristic color reactions. Examination of the literature revealed no other known apocynacea alkaloid identical with either of these.—E. C. DEGER. *Arch. Pharm.*, 275 (1937), 496. (L. L. M.)

Sugars—Determination of, in Plants. The plant extract is clarified. Five cubic centimeters of the clarified solution containing not more than 3.5 mg. of reducing sugar are mixed with 5 cc. of the alkaline ferricyanide in a 145 x 28-mm. Pyrex glass tube. The tube is heated in a boiling water-bath or immersed in a steam-bath and heated for exactly 15 minutes. The tube with the contents is then cooled to room temperature by immersing in running water for about 3 minutes. Five cubic centimeters of 5*N* sulfuric acid are added and the contents are mixed by shaking the tube. Seven to 10 drops of the Setopaline C indicator are introduced and titrated

with the 0.01*N* ceric sulfate from a 10-cc. burette until a golden-brown color appears. Estimations are conveniently carried out in batches of eight.—W. Z. HASSID. *Ind. Eng. Chem., Anal. Ed.*, 9 (1937), 228. (E. G. V.)

Sulfate—Inorganic, Micro-method for the Determination of, in Human Milk. A rapid method is described, requiring as little as 2 cc. of milk and completed in three hours. Protein is precipitated and removed as in the method of Yoshimatsu and the inorganic sulfate is precipitated as barium sulfate by a known amount of barium chloride. The excess of barium chloride is then precipitated by potassium chromate, the barium chromate dissolved in hydrochloric acid to which benzidine hydrochloride has been added and the resulting deep red color is estimated colorimetrically. With pure solutions of potassium sulfate the method gave results which deviated on an average of ±3.6% from the theoretical value. When sulfate was added in known amounts to human milk, the variation from the theoretical recovery varied from +9.7 to −4.0% (average deviation ±3.9%).—K. YOSHINO. *Tôhoku J. Exptl. Med.*, 30 (1937), 501–505; through *Physiol. Abstr.*, 22 (1937), 701. (F. J. S.)

Tartaric and Citric Acids—Method for Distinguishing between. Add the sample, in crystalline or powdered form, to several cc. of carbon tetrachloride (*d.* 1.594) in a dish. Citric acid (*d.* 1.542) will float; while tartaric acid (*d.* 1.760) will sink.—V. EVRARD. *J. pharm. Belg.*, 19 (1937), 719–720. (S. W. G.)

Tin and Tin Oxide. Determination of Tin, Stannous and Stannic Oxides in Stannoxyl Tablets and Similar Preparations. The author has devised methods for the determination of tin, of hydrochloric acid-soluble tin and tin compounds, of total available tin and stannic oxide and stannous oxide in self-prepared samples, in Stannoxyl Tablets (which tablets are stated to contain tin 42.50%; stannous oxide 7.50% and sugar and starch 50% and in which the author found 36.3% tin and 7.57% stannous oxide) and in Tin Ox Tablets which are stated to contain 10% each of tin and stannic oxide and in which the author found tin 7.4%, stannic oxide 8.7% and 6% ferric oxide. Results of analyses of Stannotabletten and Tabulettæ Stannydi are also given.—H. J. VAN GIFFEN. *Pharm. Weekblad*, 74 (1937), 250. (E. H. W.)

Toxic Gases Detection Apparatus. A series of chemical tests are being worked out to enable quantitative colorimetric estimation to be performed by means of a prepared test paper on the following toxic gases: hydrogen sulfide, arsine, sulfur dioxide, nitrous fumes, organic halogen compounds, aniline, prussic acid, chlorine, carbon disulfide, carbon monoxide, phosgene, benzene and nitrobenzene. Monographs will be issued as the tests are developed.—ANON. *Chemistry and Industry*, 56 (1937), 821. (E. G. V.)

Vitamin—Antirachitic, Isolation of, from Tuna-Fish Liver Oil. The identity of vitamin D of fish-liver oil with the antirachitic irradiation product of ergosterol has not been established. It is known that slight variations in molecular structure do not necessarily alter the antirachitic action except in the matter of potency. Thus, the naturally occurring vitamin, the irradiation production of 22-dehydroergosterol and that of 7-dehydrocholesterol have qualitatively the same physiological action. The identity or nonidentity is best determined by feeding experiments on different animals, since the isolation of the natural vitamin in a pure state presents insurmountable difficulties. Natural vitamin D and crystallized vitamin D_2 from ergosterol have the same activity when tested on rats, but show a great difference in activity on chickens with experimental rickets. Vitamin D was obtained in concentrated form from tuna-fish livers by two partitions between methyl alcohol (90% then 95%) and benzine, followed by adsorption on aluminum hydroxide in the presence of indicator red 33 which has the same adsorption properties as the vitamin and serves as a marker in the chromatogram. The starting material was a concentrate from tuna-fish liver containing 80 international units per mg., or a vitamin content of 0.32%. The first purification was made with several partitions between benzine and methyl alcohol. With 90% methyl alcohol the bulk of vitamin A goes into the methyl alcohol phase and is thus removed, then with 95% methyl alcohol the vitamin D is extracted. The vitamin D is thus enriched fourfold. This process is superior to the removal of vitamin A by maleic anhydride and permits a subsequent recovery of the A. Adsorption on aluminum hydroxide in presence of indicator red whereby a sharply defined colored zone is obtained concentrates the vitamin D to a content of 25 to 30%. After elution of the adsorbed vitamin, removal of indicator and cholesterol, and esterification with 3,5-dinitrobenzyl chloride, a further adsorption of the ester from benzene-benzine on aluminum hydroxide followed by elution with acetone and addition of methyl alcohol gave a

crystalline 3,5-dinitrobenzoate of vitamin D, having a melting point of 128° to 129° C. Saponification with 5% potassium hydroxide in methyl alcohol liberated the vitamin as an oil with a specific optical rotation of 100°. This vitamin was identical with the vitamin D_3 obtained by irradiation of 7-dehydrocholesterol; the melting point of the two dinitrobenzoates when mixed together showed no depression; both D_3 preparations had an antirachitic potency of 25,000 international units when tested on the rat.—H. BROCKMANN. *Hoppe-Seyler's Z. Physiol. Chem.*, 241 (1936), 104–115; through *Chimie & Industrie*, 38 (1937), 107. (A. P.-C.)

Vitamin Assay Committee—Report of, of the American Drug Manufacturers' Association. I. The Practical Application of the Spectrophotometric Method for Assay of Vitamin A. Six tables are presented: results of Vitameter assays—"E Values"—A. D. M. A. Laboratories; results of vitameter assays—"E Values"—Coöperating Laboratories; results of spectrophotometric assays—"E Values"—A. D. M. A. and coöperating laboratories; comparison of vitameter and spectrophotometer values from same laboratories—"E Values;" deviation of the respective vitameter values from the average—A. D. M. A. Laboratories; Vitameter data—applying the correction factor for each laboratory. There is considerable discussion of the tabulated results. The committee's conclusions are as follows: The data from the various laboratories show that individual laboratories can obtain consistent results, and that the results of different laboratories bear a fairly constant relation to those of other laboratories. It is quite apparent from the results of this study that in order to correlate the data of different laboratories it is essential to refer the data of all laboratories to a standard of reference. The U. S. P. Standard of Reference Cod Liver Oil, which is being widely used for biological assays, is well suited to this need. The average "E value" obtained for this oil by the Vitamin Committee was 1.61. The vitamin A potency of the U. S. P. Standard of Reference Cod Liver Oil has been officially designated as 3000 vitamin A units per Gm. Hence, the tentative factor for converting vitameter E values into U. S. P. XI vitamin A units per Gm. is 1875. It is apparent from the statistical discussion of the data obtained in this study, that in conducting vitamin A assays each laboratory must apply a factor for converting its "E values" into U. S. P. Standard of Reference Cod Liver Oil biological vitamin A units. In practical operation the vitamin A potency of a cod liver oil may be computed in terms of U. S. P. XI units per Gm. from the Vitameter "E value" by

$$\frac{1.61 \text{ times } 1875 \text{ times "E value" of oil being assayed}}{X}$$

where X = the "E value" obtained by the individual laboratory for the U. S. P. Standard of Reference Cod Liver Oil.—A. D. HOLMES, A. BLACK, C. R. ECKLER, A. D. EMMETT, F. W. HEYL, C. NEILSEN and E. J. QUINN. *J. Am. Pharm. Assoc.*, 26 (1937), 525. (Z. M. C.)

Vitamin A Products from Fir Needles. The following methods were used: (1) Digestion of the needles with petroleum ether boiling at 29° to 40° C. or 29° to 70° C.; in the first case 1 Gm. of the product had a potency of more than 500 vitamin A units; in the second, about 1000 units. (2) Extraction of the dried needles in a soxhlet with petroleum ether and double saponification with alcoholic alkali; 1 Gm. of the product had a potency of at least 1000 vitamin A units. (3) Digestion of the fresh needles, after removal of water by means of 90 and 94% alcohol, with petroleum ether boiling at 45° to 70° C., with double saponification of the extracts with alcoholic alkali. A modification of this method consists in first extracting the needles with acidulated water. In both cases 1 Gm. of the product has a potency of about 2000 vitamin A units.—S. N. MATSKO. *Voprossy Pitania*, 5 (1936), 49–56; through *Chimie & Industrie*, 38 (1937), 106. (A. P.-C.)

Vitamin D—Determination of. Vitamins D_2 and D_3 give with antimony trichloride in chloroform an orange-yellow color which soon reaches maximum intensity and shows a sharp absorption band at 500 mμ. Tachysterol behaves similarly. All other sterols and sterol derivatives examined give much weaker bands, some of them situated elsewhere. The two vitamins and tachysterol are thus characterized by the intensity of their absorption bands in the antimony trichloride reaction. The specificity is so pronounced that measurement of the band, the extinction of which is proportional to the vitamin concentration, is made the basis for determination. A large excess of other sterols or of vitamin A does not interfere. The method chosen is a measurement of the thickness of layer at which a definite extinction occurs, the vitamin content then being inversely proportional to the thickness. The solution to be tested (0.2 cc.) is placed in the

glass wedge and 4 cc. of saturated antimony trichloride in dry chloroform is added. After 10 to 15 minutes the extinction is measured in a Hellige colorimeter and the vitamin concentration read from a calibration curve. Vitamin quantities of 0.02 to 0.4 mg. were thus determined in reaction mixtures of 4 to 8.2 cc. The determination may be made on vitamin esters, *e. g.*, the 3,5-dinitrobenzoate of vitamin D_3, and the progress of purification by fractionation thus followed. The only interfering substance is tachysterol. A table shows the multiple quantities of other sterols, varying from 12 for cholesterylene to 400 for isopropylvitamin at which interference is first noted.—H. BROCKMANN and Y. H. CHEN. *Hoppe-Seyler's Z. Physiol. Chem.*, 241 (1936), 129–133; through *Chimie & Industrie*, 38 (1937), 106–107. (A. P.-C.)

X-Rays and the Food and Chemical Industries. The range of methods based on X-ray crystal diffraction has only begun to be used in the chemical industry, and it is not nearly well enough realized what possibilities they offer. So far, most work has been done in the use of X-rays as an auxiliary in the analysis of complex compounds, particularly natural products, vitamins, hormones, etc., and there they have shown that as an auxiliary method they are capable of shortening the ordinary chemical work by a very large factor. Their immediate practical utility may, however, be even greater. X-rays provide an ideal method for standardizing chemical products at all stages of manufacture and they are more sensitive than chemical analysis in that they detect differences of texture and body. Their value in applied chemistry has been shown by their elucidation of the problem of bleaching powder which had baffled chemists for a century. It can safely be claimed that the use of X-ray methods is likely to be equivalent in value to the chemical industry to such technics as electro-chemical analysis.—J. D. BERNAL. *Pharm. J.*, 139 (1937), 296. (W. B. B.)

PHARMACOGNOSY

VEGETABLE DRUGS

Drugs and Chemicals—Report on the Examination of. Brief reports are given of the examination of various drugs and chemicals purchased during the year by the Dutch Rijksmagazijn. The report is made by Military Pharmacist W. A. van Bronkhorst.—*Pharm. Weekblad*, 74 (1937), 513. (E. H. W.)

Guayule, the Mexican Rubber Tree. The so-called rubber tree is *Parthenium argentatum* Gray (Composita). There are seven other species in Mexico. This particular species contains 10–12% caoutchouc; *P. incanum* only 3–5%; *P. lyratum* 2–3% and the other species so little that they have no practical value. The conditions for growth and culture of the plant are discussed. The manufacture of rubber involves the following steps which are described: (1) trituration, (2) treatment of the meal, (3) sedimentation, (4) purification, (5) fulling and (6) drying of the product. The extent to which the industry has already developed is discussed.—VICTOR A. REKO. *Pharm. Post.*, 70 (1937), 332–339. (H. M. B.)

Pharmacognosy—Practical, Some Accessories for. Several pieces of apparatus useful in teaching pharmacognosy are described and illustrated. A convenient drawing board to facilitate drawings has been proved to be quite an improvement over older models of similar type. To obtain a larger field of view, a modified camera lucida was devised. For making drawings from book plates to illustrate lectures (for use with an epidiascope) and for tracing purposes in general, an illuminated tracing cabinet was devised.—L. A. KAY. *Pharm. J.*, 139 (1937), 3. (W. B. B.)

Podophyllum—Histology of. The gross and microscopic histology of *Podophyllum peltatum* is given in detail along with diagrammatic illustrations. A comparison of the histology of American podophyllum with that of Indian podophyllum (*P. emodi*) shows that the important features to be sought for in the powder of American podophyllum are: 1. The brown epidermal cells, mostly elongated rectangular prisms usually 4 to 10 times as long as wide and a small amount of similar approximately isodiametric cells, all with dark red-brown contents. 2. The fairly numerous cluster crystals of calcium oxalate, many of which are more than 60 microns in diameter. 3. The starch grains, which average about 15 microns in diameter with a range of from 2 to 30 microns.—T. E. WALLIS and S. GOLDBERG. *Quart. J. Pharm. Pharmacol.*, 10 (1937), 40–51. (S. W. G.)

Vegetable Drugs—Powdered. The author calls attention to the variation found in powdered vegetable drugs. His investigation of 37 commercial powders showed only 12 meeting the requirements with an additional 2 as possibly doubtful. The 37 samples investigated covered the following drugs: digitalis leaves; senna leaves; lobelia herb; fennel fruits; coriander fruits; anise fruits; rhubarb roots; gentian roots, ginger rhizomes; jalap roots; cascara bark and cinchona bark. A table of results giving color, fineness of powders, ash, microscopical and microchemical observations and price is given. A table is also given comparing the preservation requirements of the Belgian Pharmacopœia IV, the Swiss Pharmacopœia V, and the Netherlands Pharmacopœia (1926). Requirements of the following drugs are included in the latter table: Leaves: belladonna, digitalis, hyoscyamus, stramonium; Herbs: lily-of-the-valley, Indian hemp, lobelia; Flowers: mullein; meals; mustard seed, linseed; Roots: angelica; marshmallow and Spanish fly, squill, ergot, balsam of tolu, asafœtida, ammoniac, euphorbia and manna.—P. DELTOUR. *Pharm. Tijdschr.*, 14 (1936), 130. (E. H. W.)

Vegetable Drugs—Regulation of. The author discusses the history of the subject and various methods of regulating commerce and quality of crude drugs. Among the items discussed is the regulation of the paprika trade in Hungary. Regulations covering chamomile, peppermint, mallow leaves, anise, fennel and others are also covered.—W. C. DE GRAAFF. *Pharm. Weekblad*, 74 (1937), 285. (E. H. W.)

PHARMACY

GALENICAL

Filtration, Expression, Centrifugalization and Drying. Commercial methods with illustrations.—ANON. *Riechstoff-Ind. Kosmetik*, 12 (1937), 143–148. (H. M. B.)

Galenical Pharmacy in the Six-Semester Curriculum. A discussion covering tinctures, fluidextracts, extracts, homeopathic tinctures, suppositories, homeopathic triturations, ointments, emulsions, pills, infusions, decoctions and tablets.—K. ZIETAN. *Apoth. Ztg.*, 52 (1937), 976–980. (H. M. B.)

Ointments—Color Changes in. Certain ointments which exhibited color changes were subjected to investigation. The most striking changes occurred in those ointments where a salt of bismuth was present as an ingredient. The following ointments were investigated: (1) Ointment of Bismuth with Camphor, N. F., (2) Compound Resorcinol Ointment, B. P. C., (3) Simple Resorcinol Ointment, B. P. C., (4) Compound Bismuth subgallate Suppository, B. P. C. In the case of color changes occurring in Ointment of Bismuth with Camphor, phenol is said to play some part in the change. Oxidation of the resorcinol is said to be responsible for the color change that occurs on exposure to air of the B. P. C. Compound and Simple Resorcinol Ointments; also, it is suggested that development of a greenish color in these ointments may be due to the reaction of the alkaline ointment with the oxidized resorcinol.—J. HALL. *Pharm. J.*, 139 (1937), 30. (W. B. B.)

Paraldehyde B. P.—Decomposition of, on Storage. A large number of samples of paraldehyde were examined with regard to the decomposition that takes place during storage. Although the storage recommended by the British Pharmacopœia undoubtedly preserves the material the ideal conditions cannot be attained in practice and a good deal of paraldehyde that may be standing ready for current use will be below the official standard. Seven 1-lb. samples of paraldehyde, obtained from leading manufacturers, were examined at the time they were received and then stored in a cool cupboard, at a maximum temperature of 15° C., for re-examination. The results are given in a table which shows that after two months' storage, during which time the samples had been protected from light, all had deteriorated with the exception of one sample, and this showed no change. Studies of the paraldehydes included tests for specific gravity, fractionation, acidity, aldehyde and peroxide compounds. Conclusions drawn were that storage in the dark gave no marked protection against decomposition; that the greater the air space in the bottle the greater the decomposition and the more rapid; and that paraldehyde stored in white bottles decomposed more quickly than that in amber bottles.—J. S. TOAL. *Pharm. J.*, 139 (1937), 153. (W. B. B.)

Syrup of Ferrous Iodide—a Better Method of Preparation for. The author criticizes the method of preparation of this syrup in the (Dutch) Pharmacopœia and suggests the following

method: Place the required amount of water in an Erlenmeyer flask, then add the total quantity of iodine and follow this with the powdered iron in successive small amounts accompanied by cooling the flask. The first additions of iron will combine rapidly and as soon as a certain amount of the iron is combined as ferrous iodide the remainder of the iodine will dissolve in the ferrous iodide solution just as it does in potassium iodide solution. In this way a rapid action is obtained between finely divided iodine and finely divided iron; the reaction is so rapid that the flask must be well cooled. After successive additions of iron it will be observed that some iron remains on the bottom of the flask. The resulting solution is not yellow or brown (ferric) but pure green (ferrous) and may readily be filtered. Too much water has not been used which will allow the use of additional water for washing filters and taking up crystallized sugar. Other advantages of this method over the pharmacopœial method are discussed.—E. VAN EIJK. *Pharm. Weekblad*, 74 (1937), 371. (E. H. W.)

Tolu—Syrup of. The B. P. method of preparing Syrup of Tolu has been described as uneconomic. Due to the very low solubility in water of the constituents of balsam tolu, most of the balsamic resins and the esters are left in the "spent" balsam thus entailing a loss. Experiments were conducted to decide experimentally the quality of Syrup of Tolu B. P. and Syrup of Tolu B. P. C. The saponification, acid and ester values of the two syrups were compared and it was concluded that the B. P. C. syrup is richer in the soluble constituents of the balsam than syrup made according to the B. P. The pronounced aroma of the B. P. C. syrup is explained by its high ester value. The slightly higher acid value of the B. P. syrup is explained as being due to the possible decomposition of the balsam by boiling water into resin-acids which impart their acidity to the syrup.—W. H. JOSHI. *Pharm. J.*, 139 (1937), 316. (W. B. B.)

PHARMACOPŒIAS AND FORMULARIES

Pharmacopœia—Guy's Hospital. The first eighty pages of Guy's Hospital Pharmacopœia, under the heading "Formulary," give the hospital formulæ, together with selected preparations of the B. P. C., the latter being included in summarized form, so as to show the proportion of active ingredients. There is little that calls for comment in the formulæ themselves, most of which are sanctioned by tradition. It is interesting to note the retention of an injection of ergotoxine ethane sulfonate (with physostigmine and strychnine) and the absence of an ergometrine injection.—ANON. *Pharm. J.*, 139 (1937), 570. (W. B. B.)

Pharmacopœia—L. C. C., 1936. A Review. In April 1930, the London County Council assumed responsibility for the hospitals previously controlled by no fewer than 26 separate bodies, thus becoming the largest hospital authority in the world with an annual expenditure on its hospitals amounting to approximately 30 million dollars. It follows that the London County Council Pharmacopœia, which has just been issued, is of considerable importance on account of the magnitude of the interests involved, and is likely to exert a marked influence on the pharmacopœias of other hospitals, and on hospital pharmacy in general.—ANON. *Pharm. J.*, 138 (1937), 29. (W. B. B.)

NON-OFFICIAL FORMULÆ

After Shaves. An *after-shave lotion* should have antiseptic and mild styptic action, may contain a local anesthetic to relieve smarting, an acid to neutralize residual alkali left on hydrolysis, an astringent and a skin softener. The various substances giving these properties are discussed. A good lotion should contain alcohol (10–30%), skin softening compound (3–5%) astringent (0.5%), menthol (0.05%), local anesthetic (0.1–0.5%); the perfume used should be of the water-soluble type and not too lasting. *After-shave talcs* usually contain talc (60–90%), zinc oxide (5–10%) (this may be replaced by twice the amount of titanium oxide), zinc stearate (5–10%), kaolin (5–20%) and precipitated chalk (5–15%). *Styptics* generally contain potassium alum with 2–4% titanium oxide to yield a translucent stick. *Creams* for the purpose of cooling and soothing the skin consist of a vanishing cream with a small amount of menthol and oils to lubricate and condition. The following tested formulæ are offered: (1) *Lotion.*—Witch-hazel 15.00, alcohol 10.00, alum 0.50, menthol 0.05, ethyl aminobenzoate 0.05, boric acid 1.00, glycerin 5.00, water 68.40, (2) Talc 68.0, zinc oxide 10.0, zinc stearate 7.0, precipitated chalk 5.0, kaolin 10.0, (3) Talc 57.0, zinc oxide 15.0, magnesium stearate 5.0, magnesium carbonate 8.0, kaolin 15.0, (4) Glyceryl monostearate 18.5, peanut oil 4.2, lanolin 2.5, sorbitol 85% 6.0, menthol 0.1, alcohol 5.0,

water 63.7, (5) Alcohol 10.00, zinc sulfate 0.50, ethyl aminobenzoate 0.10, citric acid 1.00, sorbitol 85%—5.00, water 83.40, (6) Stearic acid 2.0, potassium hydroxide 0.1, powdered karaya 0.5, cocoa butter 2.0, alcohol 10.0, glycerin 8.0 and water 77.4.—JOSEPH KALISH. *Drug and Cosmetic Ind.*, 41 (1937), 52–53. (H. M. B.)

Agents for Sun Tan and to Protect from Sun Burn. The modern preparation for the protection from the sun contains specific substances which to a certain degree act as light filters and which lessen without completely excluding the intensity of the active rays. Aesculin, β-methylumbelliferon, the sodium salt of β-methylumbelliferon acetic acid, anthranilate and quinine salts are used for this purpose. The following formulæ are offered: (1) β-methylæsculitin 3 Gm., potash 0.03, glycerin 5, alcohol (92%) 95 and terpeneless oil of lavender 0.5 Gm. (2) Benzyl cinnamate 10 Gm., menthyl salicylate 30, light sesame oil 500, olive or peanut oil 400, cetiol (refined sperm oil) 50, lavender oil 10, fat-soluble brown 0.1, nipasol 20, fougere 4922 (Dragoco 2). (3) *Light Protecting Day Cream.*—Glycerin monostearate 100 Gm.—stearic acid 150, menthyl salicylate 90, glycerin 50, geraniol 10, water 600; add the hot water to the melted ingredients, stir until cool. (4) *Lotion.*—β-naphthol 1-6-8-disulfonic acid sodium, alcohol 150, glycerin 80, water 750, 7-methyl coumarin; dissolve the coumarin in alcohol, mix with glycerin and water and dissolve the naphthol derivative. (5) *A Good Cream.*—Escalol C 1 Gm., avocado oil 20, grape seed oil 30, beeswax 10, triethanol aminestearate 5, coconut oil 4, water 30, nipasol 0.2, nipagin M 0.05. (6) Zinc sulfocarbolate 30 Gm., picric acid 2, spirit camphor 9, glycerin 90, alcohol 50, water 800.—JOSEF AUGUSTIN. *Riechstoff-Ind. Kosmetik*, 11 (1936), 218–221. (H. M. B.)

Allergy—Cosmetic. A discussion of the theories of allergy, the patch test and non-allergic cosmetics.—HERMAN GOODMAN. *Am. Perfumer*, 35 (1937), 31–32, 96, 99. (G. W. F.)

"Escalol"—Protection from Sunburn with. The absorption spectra in terms of per cent absorption of this new material and other substances are given as follows: White mineral oil 0, coconut oil 23, olive oil 23, cottonseed oil 26, aqueous solution quinine bisulfate (1%) 31 (5%) 98.5, aesculitin (1% alkaline solution) 94, Escalol "WS" in 2% solution of glycerin 96. The use of the product in (*a*) oils of the following general type: vegetable oil 35 parts, Escalol "B" or "C" 1–1½, benzylcinnamate 1, mineral oil 63, perfume and color. Dissolve the Escalol in oil at 75° C., then the benzylcinnamate, cool to room temperature, add mineral oil, allow to stand for some days, perfume and filter. It is advisable to preserve the preparation. (*b*) *In Creams.*—Use Escalol "C" to the extent of 1–1½%. (*c*) *Lotion.*—Escalol "E" 4.5%, alcohol 64.5, glycerin 7.0 and water 24.0. (*d*) *Liquid Emulsions.*—(1) stearin 4.3 parts, triethanolamine 2.2, glycerin 2.6, Escalol "WS" 2.6 and water 78.6, (2) Hydroceryl 18 7.40 parts, olein 1.14, stearin 1.14 and Antranox 0.02. Heat mixture (1) to boiling, melt mixture (2) on the water-bath and add to (1) and cool the emulsion with stirring and perfume. The consistency of the emulsion may be varied by changing the amount of Hydroceryl—P. KARL. *Riechstoff-Ind. Kosmetik*, 12 (1937), 92–95. (H. M. B.)

Gelatin in Pharmaceuticals. Uses of gelatin are discussed. A new form of edible gelatin-Pharmajel is described and its uses in preparing emulsions and creams are mentioned. The following typical formula is offered: Gelatin 6 or 8 Gm., tartaric acid *q. s* p_H 3.2, syrup 100 cc., vanillin 0.04 Gm., alcohol 60 cc. water *q. s.* to make 500 cc., heavy mineral oil to make 1000 cc. The gelatin and acid are added to about 340 cc. water, allowed to stand for several minutes, then heated until dissolved. The temperature is then raised to 95–98° C. and maintained for 15 minutes, cool to 60°, add the syrup and the vanillin dissolved in the alcohol, add water to 500 cc. The mineral oil is finally poured into the aqueous mixture and the whole vigorously mixed and then homogenized.—L. F. TICE. *Drug and Cosmetic Ind.*, 41 (1937) 191–193. (H. M. B.)

Hand Creams. The best type of cream for this purpose is an oil-in-water emulsion which disappears completely when rubbed into the skin. They should contain water, the active constituent which is a fat or oil and may include vitamins and glycerin or its substitutes and an emulsifying agent such as stearic acid soap or oxycholesterin for water-in-oil preparations. The purposes of other ingredients are discussed and the following tested formulas are presented: (1) Glyceryl monostearate 20.0, lecithin 2.0, peanut oil 5.0, ethylene glycol ethyl ether 10.0 and water 63.0, (2) stearic acid 15, cetyl alcohol 1, triethanolamine 2, sorbitol 10 and water 72, (3) absorption base 25, cocoa butter 5, sesame oil 10, paraffin 5, water 55 and (4) stearic acid 20, lanolin 1.5, spermaceti 2, potassium hydroxide 1.5, glycerin 8 and water 67.—JOSEPH KALISH. *Drug and Cosmetic Ind.*, 41 (1937), 196–197. (H. M. B.)

Permanent Wave Solutions. The essential ingredient is an alkaline substance as (1) it causes the wave to take, (2) allows the solution to break through the emulsifiable oils on the surface of the hair and (3) speeds up the hydrolysis of the hair protein rendering the hair soft and pliable. Chemicals, also, give a coating effect to the hair which plays an important part in building up the hair and the lasting effects of the wave. The purposes of added chemicals are discussed. The following formulæ are given: (1) Morpholine 6, potassium sulfite 1.5, ammonium carbonate 2.5, sulphonated castor 1, water 89. (2) Monoethanolamine 6, potassium sulfite 1.5, potassium carbonate 1.5, borax 0.5, ammonium carbonate 2.5, sulfonated castor 1, water 87. (3) Ammonium carbonate 2, potassium carbonate 1.4, potassium sulfite 2.5, ammonium hydroxide (sp. gr. 0.900) 3.25, sulfonated castor 1 and water 90.—THORPE W. DEAKERS. *Drug and Cosmetic Ind.*, 41 (1937), 198–200. (H. M. B.)

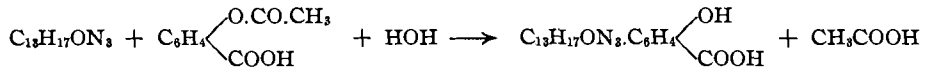
Shaving Creams. Shaving cream is an emulsion of high titre soap containing 40 to 50% of fatty acid (2.5 to 5% unsaponified) saponified with potassium and sodium hydroxide mixture in ratio of 11:1 to 4:1 with 5 to 18% of glycerin and suitable perfume. The following formulæ are given: (1) Coconut oil 10, stearic acid 35, potassium hydroxide (100%) 6.8, sodium hydroxide (100%) 1.5, glycerin 15, perfume 0.5–0.75, water 31.2. (2) Stearic acid 37, potassium hydroxide (100%) 7, water 23.5, glycerin 15, white scrap soap 12, perfume 0.5. (3) Coconut oil 4, olive oil 4, stearic acid 31.5, glycerin 15, potassium hydroxide (100%) 7.1, soldium hydroxide (100%) 1.1, water 35.8, boric acid 1, perfume 0.5. Shaving creams are a difficult group of cosmetics to prepare.—R. H. AUCH. *Am. Perfumer*, 34 (1937), 50–51. (G. W. F.)

Soap. A discussion of the use of catalysts in soap boiling. The use of small amounts of aromatic derivatives of phenol, cresols, naphthols, thymol, etc., speeds up saponification. Colloidal clay is also a catalyst.—PAUL I. SMITH. *Am. Perfumer*, 35 (1937), 70. (G. W. F.)

Vaginal Preparations. Tampons are classified as antiseptic and astringent. Suppositories, tablets, powders, ointments and jellies used for this type of medication are discussed. Fifteen formulæ are given.—A. RICHARD BLISS, JR. *Drug and Cosmetic Ind.*, 41 (1937), 50–51, 64. (H. M. B.)

DISPENSING

Amidopyrine and Aspirin—Reaction between. A powder prepared to the following formula and allowed to stand for some days changes into a yellowish sticky mass smelling strongly of acetic acid: Amidopyrine 6 parts, aspirin 6 parts, caffeine citrate 1 part. By elimination it was shown that the reaction was due to the mixture of amidopyrine with the aspirin. It occurred when the mixed substances stood in a warm place such as near hot water pipes, and could be accelerated greatly by the use of a water-bath. According to tests used it appears obvious that the acetic acid is derived from the aspirin by its decomposition and that (1) a large part of the amidopyrine in a heated mixture of these substances remains unchanged, even when a large excess of aspirin is used, or (2) a substance having the same reactions with silver nitrate as amidopyrine is formed. Such a substance is amidopyrine salicylate. It appears that this is the substance of resinous nature that is formed when amidopyrine and aspirin are heated together. The reaction is probably as follows:



Amidopyrine Aspirin Amidopyrine Salicylate Acetic Acid

E. A. LUM. *Pharm. J.*, 139 (1937), 297. (W. B. B.)

Ammonia—Cloudy. A popular cloudy ammonia may be made as follows: Into a two-gallon iron container pour three pints of water and add two ounces of stearic acid. Bring to the boil and stir vigorously to break up any lumps. While the solution is still hot (above 160° F.) pour in, while stirring, one gallon of 16° Bé solution of ammonia. Continue stirring until the mixture becomes uniformly milky. When cool dilute with more 16° Bé aqua ammonia or bottle without dilution. The product will remain permanently milk with only slight sediment formation for a period of years. If cloudy ammonia made from soap curdles and the curd floats, it is a sign that during preparation the stearic and oleic acids were mixed with too little ammonia or at too low a temperature. Add the ammonia while the stearic acid and oleic acid are hotter. Stir more

vigorously. Be sure the ammonia is added to hot acid and not hot acid to ammonia. If the curd settles to the bottom less stock solution may be used, thus forming a light cloud that will be less likely to curdle.—D. D. CATTS. *Chemical Industries*, through *C. T. J.*, 101 (1937), 50; through *Pharm. J.*, 139 (1937), 319. (W. B. B.)

Dispensing Measurements—Subjective Errors in. A check was made on the errors made in volume measurements at a graduation. Errors were classified as accidental and real errors. The accidental errors may be regarded as due to one of two reasons: (*a*) An involuntary slight tilting to make the meniscus truly coincident with the graduation, *i. e.*, in a truly horizontal plane containing it. (*b*) A slight misjudgment of the height of the meniscus, relative to the graduation. Tables are given to demonstrate analyses of probable errors made by various observers, and a graph plots the magnitude of error against the probability of error. A number of formulæ are given to demonstrate methods of calculating the types of errors made. In the author's opinion it is desirable to lay down a specific value, either quantitatively or semi-quantitatively, for the expression twice the standard deviation (which will probably vary with different types of medicaments used).—J. JACKSON. *Pharm. J.*, 139 (1937), 245. (W. B. B.)

Iron Mixture—Stable. Attention is called to a stable iron mixture, in which ferrous iron is used. The mixture is as follows: Ferrous sulfate $1^1/_2$ gr., dilute hypophosphorous acid $^1/_4$ min., dextrose 15 gr., chloroform water *q. s.* 60 mins. The mixture is made by dissolving the dextrose in some of the chloroform water and adding to it the dilute hypophosphorous acid. The ferrous sulfate is dissolved in another portion of the chloroform water, added to the dextrose solution, and the mixture made up to volume. The mixture is given three times daily in doses of 60 or 120 minims, in the treatment of anemia. It is said that there is substantial evidence that ferrous salts are much more effective than ferric salts in the treatment of anemia. Whereas in pernicious anemia the othodox treatment consists of the administration of liver or stomach preparations, the value of iron in the nutritional anemia of children has not been questioned.—ANON. *Pharm. J.*, 139 (1937), 334. (W. B. B.)

Morphine Hydrochloride—Discoloration of. A dark-colored substance separated when a 10% w/v solution of morphine hydrochloride stored in an ordinary plain white glass bottle was exposed to light for three years.—REPORT ON THE CHEMICAL LABORATORIES, CENTRAL BOARD OF REVENUE, GOVERNMENT OF INDIA, 1934–1936. *Analyst*, 62 (1937), 469. (G. L. W.)

Urinary Antiseptics. A review and the following prescriptions using mandelic acid are offered: (1) Mandelic acid 48.0 Gm., sodium bicarbonate 25.6 Gm., flavoring syrup 20 cc., distilled water 480 cc. Sig. 30 cc. four times daily. (2) Sodium mandelate 50 Gm., syrup orange 20 cc., water 480 cc. Sig. 30 cc. in water four times daily.—M. A. LESSER. *Drug and Cosmetic Ind.*, 41 (1937), 201–203. (H. M. B.)

PHARMACEUTICAL HISTORY

Karl Schönherr as a Disciple of Pharmacy. The influence and interest of this famous Austrian poet are reviewed.—FRIDO KORDON. *Pharm. Post.*, 70 (1937), 353–358. (H. M. B.)

Pharmacist—Old, Memories of an. Dr. J. De Groot, Sr., describes his life as a pharmacist beginning with 1872 when he began the study of pharmacy.—*Pharm. Weekblad*, 74 (1937), 338. (E. H. W.)

Pharmacy—Dangers of. The author mentions many of the dangers to which the pharmacist is exposed, such as those accompanying the handling of poisons; the handling and use of inflammable solvents such as ether; idiosyncrasies toward certain drugs, etc. The principal part of the paper, however, consists of the review of a booklet published in Leiden in 1744. The booklet concerns the "Diseases of Apothecaries" and was first published (first edition) in Latin in 1700 by Bernardus Ramazzini, a professor at the University of Modena (Italy). The paper is of historical interest.—J. J. HOFMAN. *Pharm. Weekblad*, 74, (1937), 445. (E. H. W.)

Pharmacy Examination in 1832. This paper contains the questions asked in an examination for pharmacists in Holland in 1832. The questions were found among the papers of J. P. Paling, first husband of the mother of J. van Riel and at one time provisor in the pharmacy of the grandmother of the late Dr. J. S. Meulenhoff. Heer Paling has inscribed the following on the papers: Questions asked me during my examination by Den Heere N. C. Fremerij, W. van Dijk, Apothecar, Harlingen, Apothecar and de Kock M. d. Five pages of interesting questions follow. —ANON. *Pharm. Weekblad*, 74 (1937), 346. (E. H. W.)

Scheele—Mark of Respect for Scheele by the French Physicians. Further contributions to the biography of Scheele.—OTTO ZEKERT. *Pharm. Monatsh.*, 18 (1937), 107–109. (H. M. B.)

Vanadium Inks—Discovery of. The contributor of this note concludes as follows: "Berzelius discovered vanadium ink in the year 1835 and communicated his discovery to the translator of the Dutch edition of his Textbook and to the Editor of *Dingler's Journal*. He wrote several letters in the ink to Wöhler, who informed him in due course of the fugitive character of the ink. Hence the description of the discovery may have been withdrawn from subsequent editions of the Textbook. It would be of interest to find out whether the Dutch translation is the only place in which the discovery is given in Berzelius' own words."—J. ZERNIKE. *Analyst*, 62 (1937), 457. (G. L. W.)

PHARMACEUTICAL EDUCATION

Hospital Pharmaceutics—Survey of the Scope and Prospects. It is contended that the hospital, especially one to which a medical school is attached, offers the best scope for pharmaceutical development. Aside from the increasing importance which the hospital must assume as a training center for pharmaceutical apprentices, it should be remembered that in order to cope with emergencies a full pharmaceutical staff is maintained by hospitals of standing, and in slack periods the manufacture of many types of products enables the staff to be completely and usefully occupied. Hospital pharmacy appears at present to offer the most favorable prospects, except to those with a bent toward business and who possess the capital necessary to acquire a well-established concern.—F. G. HOBART. *Pharm. J.*, 139 (1937), 181. (W. B. B.)

Pharmacist to a Mental Hospital. The pharmacy and dispensing of a mental hospital may never be able to complete in complexity and scope with that of a large teaching or general hospital, but nevertheless they present their own characteristic features and problems. The author discusses the work in the dispensary, the analytical work and the water supply control supervised by the pharmacist. Other duties discussed include analytical control in the laundry, sterilization of foul linen and the X-ray department.—A. E. BAILEY. *Pharm. J.*, 139 (1937), 313, 337. (W. B. B.)

PHARMACEUTICAL LEGISLATION

Chemical Patent Laws in Europe. II. Austria. A review of the patent situation in Austria is offered.—ANON. *Riechstoff-Ind. Kosmetik*, 12 (1937), 129–131. (H. M. B.)

Chemical Patent Rights in Europe. III. Czechoslovakia.—ANON. *Riechstoff-Ind. Kosmetik*, 12 (1937), 149. (H. M. B.)

Chemical Patents in Europe. A brief review of the recent Swiss patents dealing with chemical procedures, cosmetic agents, etc.—ANON. *Riechstoff-Ind. Kosmetik*, 12 (1937), 102–103. (H. M. B.)

MISCELLANEOUS

Bath—Additions to. The preparation, perfuming and coloring of bath salts are discussed in detail. The following formulæ are given: (1) Borax 30 parts, salt 50, sodium bicarbonate 20. (2) Borax 50 parts, disodium phosphate 30, sodium bicarbonate 20. (3) Glauber's salt 20 parts, sodium thiosulfate 30, salt 50. (4) Calgon 50 parts, sodium bicarbonate 30, borax 10, salt 10. Perfume 1–2% introduced by means of 2% starch colloidal silicic acid or kaolin. *Effervescent Bath Salts.*—(1) Sodium carbonate 175 parts, sodium bicarbonate 100, tartaric acid 150, sodium perborate 50, Calgon 25. (2) Sodium bicarbonate 250 parts, citric acid 125, Stärek 25, salt 100. (3) Sodium carbonate 150, sodium bicarbonate 100, sodium acid sulfate 10, Calgon 240. *Bath Tablets.*—(1)Sodium bicarbonate 250 parts, tartaric acid 225, starch 25. (2) Sodium bicarbonate 250 parts, ammonia-soda 25, saponin 50, sodium acid sulfate 175. (3) Ammonia-soda 150 parts, sodium bicarbonate 100, saponin 25, starch 10, citric acid 115, tartaric acid 100. *Perfumes for Bath Salts.*—(1) Needle oil: (*a*) bornyl acetate 175, larch turpentine 12.5, lavender oil 25, musk ambrette 12.5, oil citronella 12.5, styrax resinoid 12.5, (*b*) Siberian needle oil 50, knee pine oil 40, oil bergamot 10, oil citronella 15, oil eucalyptus 5 and (2) lavender: oil lavender 450 parts, oil bergamot 250, oil rosemary 75, oil thyme 25, borneol 30, oakmoos 20, oil geranium 50 and heliotropin 40. Medicinal bath preparations of various workers are also offered.—EKSCHNAM. *Riechstoff-Ind. Kosmetik*, 12 (1937), 140–142. (H. M. B.)

Civet Cat. The civet cat (*Viverra civetta*) is a carnivorous mammal of the family of Viverridæ, which is intermediate between the canine and true cat families. It is essentially an African species. The civet cat is distinguished by having two sets of odor producing apparatus, namely, the anal glands, and those which secrete the substance known as civet or viverreum. The analysis of viverreum ("civet") is tedious and needs great care. Chloroform is preferred as solvent; it has the advantage of dissolving resinous substances which are insoluble in alcohol and ether. Results of some analyses of civet presumed to be pure are given. Civet is used in perfumery, principally as a fixative for more fugitive odors and to modify and enhance the odor values of other perfume materials. It can be used in the form of pomade, tincture and civet absolute. The product should be stored in a gourd, mussel-shell or a horn. In any of these containers the product keeps its odor for 2 or 3 years.—R. VANDENPUT. *Perfumery Essent. Oil Record*, 28 (1937), 245, 289. (A. C. DeD.)

Coal-Tar Disinfectants—U. S. A. Standards. The drafts of specifications for cresylic acid disinfectants have been considered and approved by the National Association of Insecticide and Disinfectant Manufacturers of the U. S. A. The following are the particulars: The product shall be made from coal-tar, tar-acids and soap derived from a fat or oil of vegetable origin. It shall contain not less than 45% of tar-acids, and not more than 25% of inert ingredients (water and glycerin). The material shall contain not less than 5% of phenol, and make clear solutions with distilled water within the concentration range of 1 to 5%. It shall retain its liquid consistency when cooled down to 0° C., and maintained at this temperature for twelve hours. The specification for coal-tar disinfectants of the emulsifying type makes the following points: The material shall contain not less than 65% of oils and acids from coal-tar and not more than 10% of water. It shall be free from petroleum adulteration, and be able to stand indefinitely without separation, or any form of decomposition, under normal and reasonable conditions of storage. The product shall make milky emulsions with distilled water at a temperature of 25° C. diluted in the ratio of five parts disinfectant with 95 parts of water for disinfectants of coefficient 10 or under, and in the ratio of two parts of disinfectant to 98 parts of water for disinfectants of over 10 in coefficient. These emulsions shall not show more than a trace of oil-floating matter or sediment when stored for five hours at room temperature. The product shall remain limpid, showing no sign of naphthalene crystallization when stored at 0° C. for twelve hours.—ANON. *Pharm. J.*, 139 (1937), 31. (W. B. B.)

Cosmetics—Modern Developments in. Cetyl alcohol, present in esterified forms in spermaceti, is readily purified so as to render it free from unsaturated fatty acids. It is replacing spermaceti in the manufacture of modern cold creams. Vegetable oils have the disadvantage of being susceptible to rancidity and of being replaced by mineral oils. Lanolin is objectionable on account of its stickiness, color and smell, and the two alcohols, cholesterol and oxycholesterol, present in it and to which it owes its emulsifying power, are being used instead. Glycol stearate and other glycol esters have also been introduced recently as emulsifying agents. Triethanolamine, a viscous liquid which acts as a base, has replaced ammonia in the preparation of vanishing creams. The growth of moulds in creams may be prevented by the use of non-fermentable colloids such as Tylose (methyl-cellulose). Soapless shampoos have overcome the trouble of a deposit being left on the hair, as was the case with the older shampoos.—ANON. *Pharm. J.*, 139 (1937), 546. (W. B. B.)

Dryers and Drying. A discussion.—FRANCIS CHILSON. *Drug and Cosmetic Ind.*, 41 (1937), 204–205. (H. M. B.)

Hair—Preparations for the Care of. III. Permanent Waves, Water Waves and Hair Fixatives. These three types of preparations are discussed.—J. AUGUSTIN. *Reichstoff-Ind. Kosmetik*, 11 (1937), 108. (H. M. B.)