PHARMACEUTICAL ABSTRACTS

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CONTENTS

Biochemistry

Adrenaline—Estimation of, in Blood. A method is described for the determination of adrenaline in blood, depending upon the preferential adsorption of adrenaline from other basic and interfering substances by means of granular silicic acid with $2/3N$ sulphuric acid. The sulphuric acid solution is mixed with a hot solution of arsenomolybdic acid to which has been freshly added a sulphuric acid solution of sodium sulphite, and the whole is warmed for three minutes, allowed to stand and the color produced matched in a colorimeter with a standard color, produced in a precisely similar manner using a standard solution of catechol and also with a blank determination, the result of which is subtracted from the two former readings before calculation. The results so obtained are not absolute and a table is given for conversion of the results to mg. of adrenaline per liter, and the actual weight of adrenaline present in micrograms. The blood must be mixed immediately on withdrawal from the animal with 3% trichloracetic acid solution, and before the estimation this solution is neutralized with sodium hydroxide solution to bromothymol blue and immediately buffered at p_H 7 with a mixture of dipotassium and monopotassium phosphates. This test is of value when the concentration of adrenaline reaches or exceeds 1:50,000,000, and has an average accuracy of 92%. The blue color produced is not entirely specific for adrenaline, as glyceraldehyde, dihydroxyacetone, glycolaldehyde and reduced glutathione also give blue colors. These, however, do not interfere under the conditions specified, as they are not absorbed by silicic acid.—J. C. Whitehorn. *J. Biol. Chem.*, 108 (1935), 633; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 563. (S. W. G.)

Albumin and Globulin—Estimation of, by Biuret Method. Modifications of the biuret method and of the technique for precipitation of globulin, provide a clinically useful process for protein estimations of serum and urine. Serum protein in 0.24% solution preserved with chloroform, is preferred as a standard. The fact that albumin and globulin yield solutions of practically the same intensity in the biuret test, is confirmed. The usual assumption that $1.5M$ sodium sulphate is equivalent to $2M$ ammonium sulphate for salting out globulin is untrue, and it is important to standardize the procedure in this respect. The solution can be filtered immediately, instead of standing for three hours, provided that the solution is passed through the same filter again immediately after clear filtrate appears.—J. Fine. *Biochem. J.*, 29 (1935), 799; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 563. (S. W. G.)

Alcohol—Determination of, in Blood. The determination of the alcohol content of the blood makes possible an approximate estimation of the amount of alcohol which has been consumed. By the method of Widmark this determination may be carried out on less than 0.5 cc. of blood. About 0.20 cc. of the sample is placed in a small glass dish which is sealed to a rod projecting downward from the stopper of a small conical flask. In the flask is placed 2 cc. of a 0.2% solution of potassium dichromate in concentrated sulphuric acid, the stopper is inserted and the flask is heated at 50° to 60° C. for two hours. After cooling, water is added and the contents of the flask titrated with $N/100$ thiosulphate solution. A blank experiment is carried out at the same time, and from the difference the amount of alcohol present is calculated, 1 cc. of $N/100$ thiosulphate being equivalent to 0.113 mg. of alcohol. Since the sample of blood does not actually come into contact with the reagent, only a few volatile compounds such as acetone or acetaldehyde are able to interfere with the determination. The determination may be carried out on the serum from coagulated samples of blood as there is no loss of alcohol on keeping.—A. Gronover. *Z. Unters. Lebensm.*, 70 (1935), 34; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 721. (S. W. G.)

Anterior Pituitary—Concentration of the Antidiuretic Factor of. Pituitary preparations generally used as antidiuretics are heavily contaminated with vasopressin or oxytocin or both, the clinical effects of which are distinctly unpleasant. A more suitable extract may be made by drying the frozen glands in acetone and freeing them from *pars intermedia* and posterior lobe. The anterior lobes are extracted with 0.25% acetic acid, and this solution is dialyzed against distilled water. The dialysate is concentrated and poured into acetone. After removing the acetone, a potent extract is obtained, free from vasopressin, and containing very little oxytocin. The gonadotropic and thyrotropic hormones are also absent. It is shown that intermedin, the pigment-hormone, although present, is not responsible for the antidiuretic effect. A method for the estimation of diuretic potency expressed in mouse-units is given.—H. Downes and L. Richards. *J. Biol. Chem.*, 110 (1935), 81; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 716. (S. W. G.)

Anti-Anemic Principle of Liver. The fractionation of liver extracts containing the perni-

cious anemia principle by means of Reinecke's acid to yield a more highly potent fraction has been confirmed. Using this method products have been obtained of which 58 mg. produced a maximal reticulocyte response and a rapid remission in a patient with pernicious anemia. Applying this method to other methods of separation a further increase in hemopoietic potency has been secured so that as little as 18 mg. of the product have been sufficient to initiate a maximal reticulocyte response and rapid remissions in pernicious anemia.—J. F. WILKINSON. *Lancet*, 230 (1936), 354. (W. H. H.)

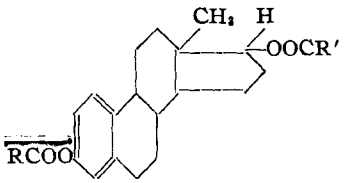
Ascorbic Acid—Urinary Excretion of, in the Dog following Ether Anesthesia. Ether anesthesia cases increased urinary excretion of ascorbic acid.—DONALD E. BOWMAN and EDWARD MUNTWYLER. *Proc. Soc. Exptl. Biol. Med.*, 33 (1935), 437. (A. E. M.)

Carotene—Method of Extracting. Carotene and lipoids are extracted from plant material by means of an appropriate solvent. Part of the solvent is removed to cause crystallization of part of the carotene, the crystallized carotene is removed and the balance of the solvent is evaporated leaving a residue consisting of carotene and sufficient plant lipoids to maintain the carotene in solution. The residue is mixed with a sufficient amount of fatty base material to produce a solution which is substantially stable against carotene separation at ordinary temperatures.—H. M. BARNETT, W. O. FROHRING and A. F. O. GERMANN, assignors to S. M. A. CORP. U. S. pat. 2,032,165, Feb. 25, 1936. (A. P.-C.)

Creatinic Compounds—Colloidogenic Properties of. In the detection of sugar in urine by means of Fehling's solution, with normal urines having a low sugar content (which necessitates the use of a large test sample) the cuprous oxide formed on more or less prolonged boiling is yellow, hydrated, amorphous and light. From a study of the substances which modify the appearance of cuprous oxide it is concluded that this can be due only to nitrogenous compounds similar to or identical with the creatine bases. In order to exert an action, they must be present in relatively large amounts, which accounts for their not acting in diabetic urines of which only small test samples are required. Creatine compounds give a marked colloidogenic power to urine.—G. DÈNIGÈS. *Bull. Trav. Soc. Pharm. Bordeaux*, 73 (1935), 97–104; *Chimie & Industrie*, 34 (1935), 1373. (A. P.-C.)

Cuprosaponite—Biochemical Characteristic of. When cuprosaponite solutions are brought into contact with highly purified animal charcoal under definite conditions, the hemolytic activity is gradually completely destroyed, the acidity increases appreciably, but the foam-producing characteristics are unaffected.—C. A. SAGASTUME and P. L. PONCE. *Rev. facultad cienc. quim. (Buenos Aires)*, 9 (1935), 29–34; through *Chimie & Industrie*, 34 (1935), 1370. (A.P.-C.)

Dihydrofollicle Hormone—Acyl Derivatives of, and Method of Making. The substance is a follicle hormone compound having the following formula:



in which R and R are alkyl or aryl groups.—ERWIN SCHWENK and FRIEDRICH HILDEBRANDT, assignors to SCHERING-KAHLBAUM A.-G. U. S. pat. 2,033,487, March 10, 1936. (A. P.-C.)

Enteric Coatings. II. Excretion Studies with Sodium Salicylate Tablets. Calcium sulphide-methylene blue tablets have been used in testing enteric coatings qualitatively. The present paper deals with quantitative determinations. Salicylates are excreted rapidly but incompletely in the urine mainly as such, slightly as salicyluric acid. Absorption of salicylates is rapid, so only small amounts are found in feces. Hanzlik and co-workers concluded that about 20% of salicylates are destroyed in the body. Rate and duration of excretion vary with the dosage, the individual and the individual's state of health. Statements differ, the range being from 24 to 48 hours. Quantitative recovery of salicylates from body fluids and tissues is difficult because the salicyl group is conjugated with glycocoll forming salicyluric acid and because of colloidal and other interfering substances. None of the methods that have been developed is altogether satisfactory. A steam distillation method adapted to this use by Thoburn and Hanzlik was found to be more satisfactory than others the author tried. The method involves "hydrolyzing

an aliquot portion of urine which has been collected until the voided specimen when extracted with ether and tested with ferric alum, is salicyl-free; distilling with steam until the salicylates are driven over; colorimetric estimation of the distillate with ferric alum." The author used some modifications. Fifty cc. of urine were used instead of 100 cc. Only enough phosphoric acid was used to make it distinctly acid. For the colorimetric comparison in Nessler tubes, salicylic acid was used instead of sodium salicylate. A 1% solution of iron and ammonium sulphate which had been previously boiled and filtered was superior to the 2% solution. Eight individuals from 10 to 25 years old were each given three 5-grain tablets of sodium salicylate, both uncoated and enteric coated. A 48-hour specimen of urine was collected in each case and several determinations were made on each sample. A tabulation covers findings. There is close agreement between the quantities of salicylates excreted with the coated and uncoated tablets. There was no gastric irritation, indicating that coating was enteric. The average recovery following injection of 15 grains of salicylates is approximately 30%.—MILTON WRUBLE. *J. Am. Pharm. Assoc.*, 25 (1035), 1074. (Z. M. C.)

Follicular Hormone—Process for the Preparation of Concentrated Aqueous Solutions of. The hormone is dissolved in an aqueous solution of resorcinol.—SOC. ANON. PRODUITS ROCHE. Belg. pat. 408,881, May 31, 1935. (A. P.-C.)

Fructose—Determination of, in Blood. A new colorimetric method for the determination of fructose in blood has been developed, based on the reaction between fructose and bile salts. Originally proposed by Scott for the estimation of traces of bile salts, the same reddish purple color is developed with excess of sodium tauroglycocholate and a trace of fructose. Five cc. of whole blood is cleared by heating with zinc sulphate and sodium hydroxide. The acidified filtrate is evaporated to dryness. The residue is warmed with concentrated hydrochloric acid and the filtered solution compared with a fructose standard prepared similarly. After ingestion of 50 Gm. of fructose, 10 mg. and 5 mg. per 100 cc. of blood appear normally after one and two hours, respectively.—L. D. SCOTT. *Biochem. J.*, 29 (1935), 1012; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 565. (S. W. G.)

Gastric Mucin—Estimation of. The author describes a method of estimating the mucin in gastric juice. A standard control is prepared by extracting the mucin from a fresh pig's stomach. After the addition of *N*/20 sodium hydrate solution it is filtered and to the filtrate a few drops of acetic acid are added. The resulting precipitate is centrifuged and decanted. After the addition of *N*/20 sodium hydrate solution, it is reprecipitated in acetic acid and centrifuged. The final precipitate is washed twice with slightly acidulated distilled water, dried and pulverized. From the powder, dilutions of 1 to 1,000 and higher are made. A photometric reading is then taken and a second one five minutes after adding a few drops of acetic acid. The difference in these readings is charted in ordinates, the concentrations in abcissæ (in Gm. per 1,000). The points thus charted lie in a straight line, less so for the higher dilutions. The test specimen of a normal gastric juice is prepared by dissolving the flocculent mucin in sodium hydrate solution; to 4 cc. of this solution 3.5 cc. of *N*/20 soda solution are added. Photometric readings are then made as in the case of the control specimen. The difference in these is recorded on the chart and the corresponding mucin reading, multiplied by two, four or six, according to the dilution, indicates the amount of mucin in the test specimen. To estimate the mucin in an anachlorohydric juice, a small portion is filtered and the filtrate treated as above described. Matter left on the filter is suspended in the remaining liquid, to which soda solution has been added, and the total mucin is estimated by the technique described. Errors in the readings may arise from the presence in the juice of saliva, bile, blood and alimentary debris. Moreover the readings are correct only for high dilutions of at least 1 in 1,000. The errors do not exceed 5% and the readings are sufficiently exact for all clinical purposes.—D. VINCENT. *Lyon Med.* (Nov. 10, 1935), 549; through *Brit. Med. J.*, 3917 (1936), 244D. (W. H. H.)

Gonad Stimulating Hormone—Isolation and Purification of. Animal pituitary glands are ground and dried; the material is extracted with aqueous pyridine; the dried pyridine extract is leached with water and the gonad stimulator hormone is precipitated from the aqueous solution by means of alcohol.—FREDERICK L. HISAW and HARRY L. FEVOLD, assignors to WISCONSIN ALUMNI RESEARCH FOUNDATION. U. S. Pat. 2,030,210, Feb. 11, 1936. (A. P.-C.)

Halibut Liver Oils—Characteristics of. The authors of this paper give much data on the blue value, iodine value, refractive index, unsaponifiable matter and sterols in the unsaponifiable

matter of a large number of natural halibut liver oils. They also give numerous results of the examination of the unsaponifiable fractions of some of these oils. These results are discussed from the standpoint of the relationship existing between the iodine value and the vitamin A content of the oils which is shown to be an inverse ratio between the amount of sterol and of vitamin in the unsaponifiable matter. Attention is also called to the difficulty of extracting the oil from halibut liver by the usual steam process. A microscopic examination of both cod livers and halibut livers was made and the authors conclude that this difficulty is explained by the fact that the halibut livers have a much denser structure than the cod livers.—R. T. M. HAINES and J. C. DRUMMOND. *Analyst*, 61 (1936), 2–7. (A. H. C.)

Heparin—Chemistry of. Heparin, an anticoagulant occurring in the liver, has been isolated in such quantities as to make a chemical investigation possible, and it has been found that it may be separated into two fractions by the addition of brucine to the aqueous solution, following electrodialysis to remove ionized sulphates and other impurities. The insoluble brucine salt which slowly precipitates is decomposed with alkali, the brucine is extracted with chloroform, and, after acidification, acetone is added. The substance which separates is found to have a much stronger heparin activity than the original substance, and is shown to have a content of uronic acid, hexosamine and ester sulphate corresponding to the composition of a chondroitintrisulphuric acid. From the mother liquor of the original brucine precipitation, a substance was isolated, almost devoid of anticoagulant activity, having a composition similar to that required by a chondroitinsulphuric acid. Both these substances are found to contain nitrogen. Heparin is remarkable in that it gives from 25–45% of ash on ignition, and this is shown to be magnesium sulphate, introduced by the action of the magnesium contained in the Lloyd's reagent used for purification, upon the sulphate residues of the substance. An improved method for the determination of uronic acid is described.—E. JORPES. *Biochem. J.*, 29 (1935), 1817; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 717. (S. W. G.)

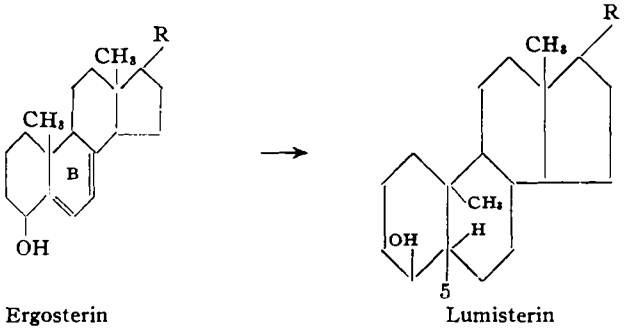
Hormones—Isolation and Purification of. Luteinizing hormones are produced from the pituitary gland of animals by comminuting and drying the gland matter, extracting with aqueous pyridine, drying the extract and treating with water to remove water-soluble impurities and leave a residue having the properties of luteinizing the follicles and prolonging the life of *corpora lutea*.—FREDERICK L. HISAW and HARRY L. FEVOLD, assignors to WISCONSIN ALUMNI RESEARCH FOUNDATION. U. S. Pat. 2,030,209, Feb. 11, 1936. (A. P.-C.)

Insulin, Crystalline. Scott has already shown that it is possible to obtain crystalline insulin only when the metals zinc, nickel, cobalt or cadmium are present, either intentionally or as impurities, in the solution. The respective merits of various buffer solutions as crystallizing solvents are detailed. Insulin hydrochloride, with an ash content as low as 0.02% may be precipitated in amorphous form from a solution of the crystals in $N/10$ hydrochloric acid by means of alcohol or acetone. In some experiments slight inactivation occurred in this procedure. Many attempts to fractionate this ash-free insulin have failed to yield more active fractions. Crystals were prepared using zinc, cadmium and cobalt. The content of metal was constant in triplicate experiments, and the amounts (zinc 0.52%, cadmium 0.77%, cobalt 0.44%) were proportional to the atomic weights of the metals. It is suggested that the metal occurs as a chemical constituent of the crystals and not merely as an impurity.—D. A. SCOTT and A. M. FISHER. *Biochem. J.*, 29 (1935), 1048; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 717. (S. W. G.)

Lead—Colorimetric Determination of, in Urine. The micro-colorimetric method for the determination of lead described in this paper is suitable for use in a clinical laboratory, since the time required for a determination is reduced to three hours and only small quantities of urine are used. One hundred cc. of urine are adjusted to p_H 4.5 with glacial acetic acid using bromocresol green as indicator, and 0.5 Gm. of ammonium oxalate is added, followed by 2 cc. of a 10% calcium chloride solution. After twenty minutes the solution is centrifuged, the liquid discarded, the precipitate broken up with a glass rod, washed with 15–20 cc. of distilled water containing a little ammonium oxalate and again centrifuged. The wash liquor is decanted, the precipitate drained free from water, mixed with 2 cc. of perchloric acid and 2 drops of 30% hydrogen peroxide solution, and digested for at least twenty minutes in a micro-Kjeldahl digestion apparatus. While still hot, 3 drops of the strong hydrogen peroxide solution are added, and the mixture again heated for three minutes. When cool, 5 cc. of water are added, followed by 3 cc. of 10% solution of citric acid, and the mixture is made just alkaline to bromothymol blue with concentrated ammonium hy-

droxide solution. The clear solution, or a 5-cc. aliquot if much lead is present, is adjusted to about 20 cc. in a separating funnel, 4 drops of 20% solution of sodium cyanide are added and the whole is shaken vigorously with 1 cc. of a 0.003% solution of diphenylthiocarbazone in carbon tetrachloride. The extraction is repeated until no further red color is produced in the carbon tetrachloride layer, and the combined extracts, after being washed with about 10 cc. of ammonium hydroxide solution containing 2–3 drops of sodium cyanide solution is adjusted to a definite volume and compared colorimetrically with a known standard prepared in a similar way. The red color of the organic extract may be converted to green, if desired, by shaking with dilute hydrochloric acid, before the colors are compared. A blank determination should be conducted at the same time; and in this way amounts of lead up to 0.01 mg. may be determined with an accuracy of ±0.004 mg. A special tube, in which the whole determination may be conducted, is described and illustrated.—J. R. Ross and C. C. Lucas. *J. Biol. Chem.*, 111 (1935), 285; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 727. (S. W. G.)

Lumisterin. The author states that if ergosterin is irradiated with ultraviolet rays the products obtained are isomeric alcohols in the following order: ergosterin → lumisterin → tachysterin → vitamin D { toxisterin, suprasterin I, suprasterin II. It is possible that lumisterin exists only temporarily during the irradiation of ergosterin. On examination of the products obtained during the irradiation process it was found that tachysterin and vitamin D have 4 double bonds and not 3 double bonds like ergosterin. The 4 double bonds were formed during the splitting up of single bonds in the ring; the characteristic cyclo-pentano-phenanthrene skeleton of the sterin is not to be found in the vitamin D. Perhydro-lumisterin and its derivatives indicate that it has only 3 double bonds. Lumisterin has 3 unsaturated bonds and dihydro-lumisterin has 2 unsaturated bonds. It was of interest to ascertain whether lumisterin had the same structural formula as ergosterin. In order to prove this, the method of Diel, for selenium dehydration, was employed. During the selenium dehydration process no crystals were obtained from vitamin D. The hydrocarbon $C_{18}H_{16}$ (methyl-cyclopenton-phenanthrene) was isolated with little difficulty from lumisterin. This compound can also be obtained by the selenium dehydration of ergosterin, cholesterin and cholic acid. The action of ultraviolet rays does not remove any carbon atom, but brings about a rearrangement of the molecule. The spectrum of lumisterin is similar to that of ergosterin. O. Rosenheim and H. King give the following explanatory formula for converting ergosterin to lumisterin:



Ergosterin Lumisterin

Through the displacement of the double bonds, the atom 5 becomes asymmetric. Lumisterin gives no precipitate with digitonin. Another possible difference between ergosterin and lumisterin may be the sterical arrangement of the asymmetric hydrocarbons; for example, on carbon atom 9 or carbon atom 10. An attempt was made to obtain another product neo-ergosterin using eosin, sunlight and dehydration. The results were not satisfactory.—K. Dimroth. *Ber.*, 68 (1935), 539. (G. B.)

Male Sexual Hormones. A brief review of recent work on androsterone and testosterone.—L. Ruzicka. *Chimie & Industrie*, 34 (1935), 1263–1269. (A. P.-C.)

Œstrus Producing Hormone—Stability of the International Standard in Alcoholic Solution. Although Butenandt has reported that the stability of œstrone in alcoholic solution is

small, the authors found that a 0.002% solution showed no decline in activity when stored at −2° C. or room temperature, as measured by vaginal cornification in ovarectomized mice as well as by ultraviolet absorption. Only slight changes followed storage at 37° C.—I. ROWLANDS and R. CALLOW. *Biochem. J.*, 29 (1935), 837; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 558. (S. W. G.)

Oxytocin. There is chemical analogy between oxytocin and insulin. An oxytocin preparation having a potency of 300 International Units was subjected to acid hydrolysis, and tyrosine, cystine and a small amount of histidine were identified in the reaction products. The authors believe that the hormone is of a peptidic nature. Its sulphur content (3.2%) is of the same order as that of insulin; perbenzoic acid, hydrogen peroxide and alkalies attack it much more slowly than they attack insulin. It is but slightly affected by sodium amalgam in sodium bicarbonate solution; iodine has little action in acid solution but reacts rapidly in neutral or alkaline solution. Oxytocin is rapidly destroyed by a neutral or weakly alkaline solution of sulphite or by hydrogen in presence of palladium. It has a much lower molecular weight than insulin.—K. FREUDENBERG, E. WEISS and H. BILLER. *Hoppe-Seyler's Z. Physiol. Chem.*, 233 (1935), 172–173; *Chimie & Industrie*, 34 (1935), 1376. (A. P.-C.)

Reno—Flavin and Vitamin B. The authors state that the flavins (reno-flavins), obtained as an extract from beef kidneys, do not render the expected reaction when fed in large doses to rats, which lack vitamin B_2. If the flavin extract is substituted with small quantities of fresh beef kidney extract then the general growth is highly improved in such rats. The factors which were responsible for this difference in reaction were found to be the following: During the extraction process of flavins (reno-flavins) from beef kidney extract, a substance is retained on Fuller's earth (the filtering agent) which modifies the action of the flavin extract so that it loses its stimulating action on animals lacking vitamin B_2. What was considered so far to be vitamin B_2 in flavins, is in reality a compound substance made of many other complex materials. Similar results were obtained by other authors who worked with lacto-flavins. The similarity between reno-flavin and lacto-flavin leaves no doubt as to the existence of some factors which are retained during the filtering process on Fuller's earth and which factors are constituents of the vitamin B_2 complex compound. These factors are evidently responsible for the general improvements (the increase in vitality) obtained in animals lacking vitamin B_2.—B. C. GUHA and H. G. BISWAS. *Ber.*, 68 (1935), 427. (G. B.)

Sexual Hormone Derivative. The patent covers an ester of the female sexual hormone (follicular hormone) $C_{18}H_{22}O_3$, which melts at about 100° C. and is believed to be the chloroformic ester having the formula $Cl–CO–OC_{18}H_{21}O$.—LORENZ ACH and WILHELM DIRSCHERL, assignors to RARE CHEMICALS, INC. U. S. pat. 2,031,581, Feb. 25, 1936. (A. P.-C.)

Sexual-Hormone-Like Esters of Polycyclic Alcohols—Preparation of. Esters of hydroxyketones of the group which comprises the male hormones and their stereoisomers are subjected to the action of reagents which can convert the ketone group into a secondary alcohol group.—SCHERING-KAHLBAUM A. G. Belg. pat. 408,846, May 31, 1935. (A. P.-C.)

Theelin—Comparison of Samples Obtained from Different Sources. Theelin may be prepared from the urine of mares—100 days pregnant, by modifications of methods already described, in which the urine was acidified, benzoated, chilled, the suspension filtered under suction and the precipitate leached with ether. After rendering alkaline to remove benzoic acid, the purified ethereal extract was evaporated to dryness, the residue was extracted with butyl alcohol and petroleum ether and the theelin finally extracted by shaking sixteen times with weak sodium hydroxide. From the impure hormone thus obtained, the semicarbazone was prepared, recrystallized several times, the hormone regenerated and finally crystallized from 50% acetone to give a constant m. p. of 253.5° to 254.0° C. By analysis the formula $C_{18}H_{22}O_2$ was assigned to the products, the yield being 1 Gm. per 10 gallons of urine. Samples of theelin prepared from human urine by the method of the same authors, described in 1930, and purified through the semicarbazone, also melted at 253.5° to 254.0° C., while other samples prepared by the dehydration of theelol by heating with potassium sulphate under reduced pressure for 48 hours, and purifying the sublimate through the semicarbazone as before, melted at 252.5° to 253.7° C. Physical data of derivatives, as well as biological assays on mice, which gave values varying only from 12,500 to 14,000 and therefore precluded the less active form, showed that the theelin obtained from all three sources was the α-isomer. There was no evidence of more than negligible traces of the

β-form.—J. M. CURTIS, D. W. MACCORQUODALE, S. A. THAYER and E. A. DOISY. *J. Biol. Chem.*, 107 (1934), 191; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 558. (S. W. G.)

Thyroxine—Ketonic Acid Analogous with. The exhibition of typical thyroid-like activity by a compound appears to depend on the presence in its molecule of the thyroxine nucleus halogenated at least in the 3:5 positions. Since many physiologically active amino-acids can be replaced by the corresponding keto-acid, the keto-acid corresponding to thyroxine was synthesized. The compound was tested on a dog by the method of Canzanelli and Rapport, and found to possess about $^3/_{11}$ of the activity of the thyroxine itself.—A. CANZANELLI, R. GUILD and C. R. HARINGTON. *Biochem. J.*, 29 (1935), 1617; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 719. (S. W. G.)

Vitamin A—Determination of. Previous work has established a high degree of correlation between determinations of vitamin A, (*a*) biologically, (*b*) by the antimony trichloride color test and (*c*) by the ultraviolet absorption at 328 mμ. Coward, *et al.*, however, found some discrepancies which could not be attributed to errors in the biological tests. Improvements in technique associated with all three methods have now facilitated a more accurate comparison. A series of 22 fish liver oils and concentrates, and mammalian liver oils and concentrates have been examined. Blue values were determined by the B. P. method, the unsaponifiable fraction being used where necessary. In addition the blue solution was examined spectrophotometrically. The ultraviolet absorption at 328 mμ was also measured on the unsaponifiable fraction where necessary. The biological assays were carried out by the method of Morgan. The results have been subjected to statistical analysis. The assays are all extrapolated to 100% of vitamin A, which is assumed to have the constants of a concentrate prepared by Carr and Jewell. Comparing the blue values and biological assays, the values for 100% of vitamin A range from 1.23×10^6–3.38×10^6 International Units per Gm. with a logarithmic mean of 1.77×10^6 units per Gm. It is computed that the limits of error of the blue value as an estimate of biological assay are 58.3–171.4% of the found value. The spectrophotometric assays similarly show a range from 1.08–2.9 $\times 10^6$ units per Gm. for 100% vitamin A, with a logarithmic mean of 1.73×10^6 units per Gm. It is computed that the limits of error of the spectroscopic value as an estimate of biological assay are 60.3–165.8% of the found value. The factors which might be responsible for these discrepancies are reviewed. Errors inherent in the color test, including the presence of inhibitors, and the presence of substances other than vitamin A absorbing in the near ultraviolet are probably the main contributory causes, but cannot explain all the discrepancies. There seems no escape from the conclusion that some cod liver oils contain a substance having the biological properties associated with the alcohol $C_{20}H_{29}OH$ (or its esters) recognized as vitamin A, but having no chromogenic power or absorption in the near ultraviolet.—R. S. MORGAN, J. R. EDISBURY and R. A. MORTON. *Biochem. J.*, 29 (1935), 1645; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 719. (S. W. G.)

Vitamin B—Ultraviolet Absorption of. A number of samples of vitamin B_1 crystals have been examined spectrophotometrically, in alcohol (75%) containing *N*/200 HCl. All specimens under these conditions showed curves with a maximum at 245 mμ to 247 mμ, and the intensity of absorption was very similar for four of the specimens, though somewhat lower for the others. On bringing to p_H 11–12 the maximum shifted to longer wave-length, and a transitory maximum appeared at 330–340 mμ, as previously observed by Peters and Philpot. The absorption is influenced by the solvent and especially by p_H. Dissolving in alcohol and then acidifying gives a different curve from that obtained by solution in acidified alcohol. In neutral alcohol two bands appear at 234 mμ and 268 mμ. In distilled water the curves are poorly reproducible on account of slight variations of p_H.—E. R. HOLIDAY. *Biochem. J.*, 29 (1935), 718; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 721. (S. W. G.)

Vitamin B_2—Components of. Recent work has shown that the flavins, which can be isolated from whey, eggs and liver, constitute only part of the vitamin B_2 complex. Young rats were given a "—B" diet consisting of caseinogen 100, rice starch 300, cottonseed oil 75, salt mixture 25, water 500, steamed for 3 hours and supplemented with cod liver oil and vitamin B_1 concentrate. Replacement of the starch by crude maize sugar improved somewhat the incidence of dermatitis; irregularities in its occurrence are attributed to differences in reserves of the vitamin. Administration of flavin caused some gain in weight, but no cure of the dermatitis. Supplemented with a yeast extract, in which all the known B vitamins had been destroyed by autoclaving for 5 hours at 120° C. at p_H 9, normal growth and cure of dermatitis occurred; 12 to 20 micrograms per

day of hepatoflavin seemed necessary for normal growth. Two types of dermatitis were observed, described, respectively, as (*a*) florid and (*b*) generalized skin affection without swelling or inflammation. György finds a supplementing action upon flavin produced by large doses of a Peter's B_1 concentrate from baker's yeast. The present authors find that their smaller doses of a similar concentrate from brewer's yeast have no such action. Some little support is given to György's suggestion that flavin prevents and cures the (*b*) type of dermatitis and the other supplement the (*a*) type. In curative tests, however, both supplements seemed to be needed for positive results. The flavin supplementary substance, György's vitamin B_6, appears to be identical with the factor Y of Chick and Copping, and to be water-soluble, dialyzable, heat-stable and alkali-stable.—H. CHICK, A. M. COPPING and C. E. EDGAR. *Biochem. J.*, 29 (1935), 722; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 560. (S. W. G.)

Vitamin C Secretion—Yearly Cycle of, by the Mammary Gland of Milch Cows. The vitamin C content of three milks of different origins was followed during the period Nov. 1933 to Nov. 1934. The three curves were parallel, the vitamin C content remaining at a high level from the end of March or beginning of April until the end of Nov., and then falling off sharply and remaining low until March. The curves show that the vitamin C content of cow milk is largely independent of the food, and, while it may be useful to give fresh fodder rich in vitamin C, this is not indispensable.—P. ROHMER, N. BEZSSONOFF and E. STOERR. *Bull. Soc. Péd.*, 32 (1934), 566; through *Bull. Soc. Sci. Hyg. Aliment.*, 23 (1935), 444–445. (A. P.-C.)

Vitamin D—Irradiation of, and Product Thereof. Highly purified vitamin D is irradiated by ultraviolet light; the irradiation product is converted into its 3,5-dinitrobenzoic acid ester; the crystal fraction first formed is separated and the ester is saponified with alkali to yield a product $C_{28}H_{44}O$, which is stereoisomeric with ergosterol, and is characterized by its increasing action on the level of blood calcium but is practically antirachitically inactive.—OTTO LINSERT, assignor to WINTHROP CHEMICAL CO., INC. U. S. pat. 2,030,377, Feb. 11, 1936. (A. P.-C.)

Vitamin E—Presence of, in Wheat-Germ Oil Unsaponifiable Matter. Wheat-germ oil was obtained by extraction of suitable commercial wheat-germ with cold trichlorethylene, and the unsaponifiable fraction extracted after saponification with alcoholic potash. The sterols, removed by cooling a methyl alcoholic solution with solid CO_2, contained sitosterol and dihydrositosterol, and showed spectroscopic evidence of ergosterol and dihydroergosterol and possibly ergosterol D. The residual liquid unsaponifiable matter was best fractionated by adsorption from a solution in petroleum ether, using a column of special alumina. Six fractions were obtained. The first, which passed quickly through the column, consisted largely of a new hydrocarbon $C_{18}H_{32}$. The second, from a yellow zone which was washed slowly through the column, contained kryptoxanthin and a highly unsaturated hydrocarbon of the squalene type. The third fraction, elutriated from the lowest part of the column, consisted largely of unsaturated alcohols; β-amyrin was isolated from this fraction. Most of the biological activity was present in this fraction, and this appeared to be associated with an absorption band having a maximum at 294 mμ and minimum at 267.5 mμ; the persistence of this band may be a measure of vitamin E potency. Refractionation of this material yielded a yellow oil active in doses of 0.1 mg. daily. The absorption disappears on acetylation (without change in biological activity) and reappears on hydrolysis. Analytical data suggest for this fraction a constitution related possibly to the sterols or amyrins, a molecular weight of about 440, two oxygen atoms, only one of which can be acetylated and which may be in a keto-enol grouping. Ultraviolet irradiation caused progressive loss of both absorption and biological activity. Hydrogenation did not affect the activity. The fourth fraction contained a pigment resembling lutein, possibly phytol, and part of the vitamin E. The fifth fraction contained lutein and much sterol. The sixth fraction, from the top of the column, also contained lutein, and strongly absorbing substances, but was not fully examined.—J. C. DRUMMOND, E. SINGER and R. J. MACWALTER. *Biochem. J.*, 29 (1935), 456; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 562. (S. W. G.)

Vitamin I-B_7—Behavior of, toward Primary Alcohols. The various fractions of vitamin B behave differently toward the various primary alcohols that were studied; methyl, ethyl, propyl, butyl and amyl. The anti-neuritic fraction is extracted completely by methyl alcohol, but only partially by propyl alcohol. The growth vitamins extracted completely by none of the alcohols studied, methyl alcohol giving the highest degree of extraction. This alcohol also gives fairly high extraction of enteral vitamin. The salient features regarding this vitamin are manifested in

the variety of intestinal disturbances observed when rice hulls are treated with the various alcohols; the production of mucous lesions and muscular lesions by the use of different alcohols would point to the existence of several enteral vitamins.—E. CANTANNI. *Biochim. Terapia Sper.*, 22 (1935), 153–161; through *Chimie & Industrie*, 34 (1935), 1376. (A. P.-C.)

Vitamin I-B_7—Behavior of, toward Solvents. Tests were carried out on the solubilities in a few solvents of the various vitamins extracted from rice hulls and brewers' yeast and confirmed the individuality of the enteral vitamin I-B_7. The latter is insoluble in the usual fat solvents, but is extracted completely by 95% alcohol which dissolves neither the anti-neuritic vitamin nor the growth vitamin. The two latter vitamins can be extracted completely by 70% alcohol, which extracts vitamin I-B_7 only partially. Water extracts the anti-neuritic vitamin completely and the other two only partially. Confirmation of the existence of an enteral vitamin destroys the hypothesis according to which nervous and digestive deficiencies have a common origin and digestive troubles are due to an alteration of the nervous system and more particularly of the vagus system.—E. MONTENECCHI. *Biochim. Terapia Sper.*, 22 (1935), 143–152; through *Chimie & Industrie*, 34 (1935), 1376. (A. P.-C.)

Vitamins—Chemical Nature of. It is now definitely established that vitamin A is related to carotene, $C_{40}H_{56}$, a widely distributed plant pigment of the class known as carotenoids. There are four isomeric carotenes known, all of which appear to give rise to the vitamin in the liver. Karrer synthesized a compound described as perhydro-vitamin A reported to be identical with the fully hydrogenated vitamin, but the vitamin itself has not been synthesized. Vitamin D has been prepared in a chemically pure crystalline form called calciferol, 5 mg. of which are equivalent to about 1 liter of cod liver oil. However, the identity of calciferol with the vitamin present in cod liver has not yet been rigorously proved, and more than one anti-rachitic vitamin may exist. For some years it has been known that vitamin D could be formed by substituting ergosterol to ultraviolet radiation. A somewhat detailed discussion of the chemical constitution of ascorbic acid (vitamin C) is given.—E. G. V. PERCIVAL. *Pharm. J.*, 135 (1935), 651. (W. B. B.)

ANALYTICAL

Acetanilid, Acetphenetidin and Neocinchophen—Identification of. Tentative microscopic methods were adopted. A 1:100 solution of acetanilid in 10% hydrochloric acid when treated with phosphotungstic acid reagent (5 Gm. of phosphotungstic acid in 100 cc. of water) gives rosettes of prisms, and when treated with a bromide-bromate reagent (0.3 Gm. of potassium bromate and 5 Gm. of potassium bromide dissolved in water and made up to 100 cc.) gives small prisms. One mg. of acetphenetidin treated with one drop of nitric acid (1:1) and a few seconds later diluted with a drop of water gives bright yellow curving branched crystals. A saturated solution of acetphenetidin in 10% hydrochloric acid treated with Wagner's Reagent (1 Gm. of iodine and 5 Gm. of potassium iodide in 5 cc. of water and diluted to 100 cc.) gives large irregular plates. A saturated solution of neocinchophen in 10% hydrochloric acid when treated with potassium thiocyanate (5 Gm. in 100 cc. of water) gives rosettes of needles and when treated with platinum chloride (1 Gm. of chloroplatinic acid in 20 cc. of water) gives needles in clusters.—*J. Assoc. Official Agr. Chem.*, 19 (1936), 103. (G. S. W.)

Ammoniacal Spirit of Anise—Assay of. The author describes a method for the determination of oil of anise and alcohol in this preparation. The oil is salted out with ammonium sulphate and filtered with noreit, from which it is extracted with ether; the ether removed; and the oil dried and determined gravimetrically. The refractive index of the oil is also determined. The alcohol is determined by distilling the filtrate after salting out the oil, and is determined in the usual way by sp. gr. of the distillate. A table showing analyses of six commercial and two self-prepared preparations is given.—H. J. VAN GIFFEN. *Pharm. Weekblad*, 72 (1935), 1309. (E. H. W.)

Antipyretics—Drugs Used as. Anti-oxygenating Properties of. About 30 compounds representing the phenols, arylamines, semicarbazides, pyrazolons and alkaloids used as antipyretics were tested as to their influence on the oxidation of benzaldehyde and ferrous sulphate by air and the decoloration of methylene blue by liver tissue. Most of the antipyretics studied caused a diminution in the quantity of benzoic acid formed from the aldehyde. The effect varied with the quantity of antipyretic used. With ferrous sulphate in neutral solution, irregular results were obtained, but in acid media results were obtained similar to benzaldehyde. In general the

antipyretics retarded the decoloration of methylene blue by extracts of liver tissue. The results showed that in general the antipyretics act as negative catalysts which may account for their action in the body.—AUGUSTIN BOUTARIC and JEAN A. GAUTIER. *Compt. rend.*, 202 (1936), 596. (G. W. H.)

Arsenic—Colorimetric Determination of. Sodium sulphide is added to the acid solution, the arsenous sulphide is washed and dissolved in 2% aqueous ammonia, silver nitrate is added to the solution and the brown coloration is compared with that given by standard arsenic solution under the same conditions. The method is rapid and accurate and may be applied to the determination of arsenic in concentrations of $<0.0001\%$, in presence of organic substances.—D. B. JOCHELSON. *Ukrain. Chem. J.*, 9 (1934), 344; through *Brit. Chem. Abstracts* A (Aug. 1935), 948.

Arsenic—Notes on the Detection of. A study of the method based on the reaction $5K_2Cr_2O_6 + 6As + 20H_2SO_4 = 6H_3AsO_4 + 5Cr_2(SO_4)_3 + 5K_2SO_4 + 11H_2O$. The arsenic is separated by the standard Marsh method, and the determination is carried out on the arsenic ring. Certain precautions are necessary, more particularly, the reagent should be boiled before use to ensure oxidation of organic matter that might be present, and water distilled over potassium permanganate should be used instead of ordinary distilled water. Within the limits of concentration tested the method gives good results.—F. SCHOOFS. *Congrès de Pharmacie (Liege, 1934)*, (1935), 181–183; through *Chimie & Industrie*, 35 (1936), 126. (A. P.-C.)

Arsenic—Rapid Titration of, in Biological Material. Ten Gm. of finely divided wet, or 2 to 5 Gm. of dry, material is covered with 20 cc. of 60% perchloric acid in a 300-cc. Kjeldahl flask and boiled over a bare flame. The flask is removed to a cork ring and 2 or 3 cc. of nitric acid added. After the vigorous reaction has subsided, the flask is heated and the contents concentrated to half-volume, when the reaction usually recommences. If the product is not nearly colorless, more nitric acid is added cautiously. The product is diluted and washed into a generating flask with water to produce 100 cc., followed by 10 drops of 40% stannous chloride, 2 drops of 5% copper sulphate, 15 cc. of sulphuric acid and finally 25 Gm. of zinc shot. The flask is immediately connected to the four absorption tubes, of which the first contains 1% lead acetate solution, and the others $N/50$ silver nitrate. Three or 4 cc. of this in the second and third tubes is sufficient for 1 mg. of As_2O_3. Fast evolution of hydrogen is desirable and the arsine is entirely swept over in twenty minutes. The tubes containing deposited silver are rinsed into one of them, and 0.1 Gm. of sodium bicarbonate and 2 Gm. of potassium iodide crystals are added. Lastly 0.5 cc. of fresh 1% starch solution is added, and the solution titrated with $N/495$ iodine. Each 0.01 cc. required represents 1 microgram As_2O_3. Twenty-four determinations may be completed in eight hours. A detailed review of the methods of other workers is given.—R. ALLCROFT and H. GREEN. *Biochem. J.*, 29 (1935), 824; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 564. (S. W. G.)

Arsenic—Risk of Error in Determining Traces of, in Organic and Inorganic Materials. In this paper the authors emphasize the necessity of complete reduction of any arsenic compounds to arsenous compounds before either Gutzeit's or Marsh's Test is applied. They recommend above all other methods the use of sulphurous acid because of its simplicity and certainty. The procedure recommended is as follows. After adding 5 to 10 cc. of arsenic-free hydrochloric acid (Sp. Gr. 1.10) to dissolve the material to be tested (for example, the product from ashing organic material with calcium carbonate) and 30 cc. of water, 0.05 Gm. of sodium bisulphite is added and the mixture heated for 30 minutes on the water-bath in the Gutzeit flask, closed with a glass Kjeldahl bulb to prevent any evaporation. (It is unsafe to evaporate the acid solution to any considerable extent, as arsenious chloride may be volatilized.) The liquid is then boiled for 2–3 minutes, until the smell of sulphur dioxide has disappeared, and fused for the actual test. They also call attention to the variability in the zinc used owing to the different states of granulation and recommend that in every case the mixture be heated to 40–60° to insure complete liberation of the arsenic.—W. A. DAVIS and J. G. MALTBY. *Analyst*, 61 (1936), 96–100. (A. H. C.)

Ascorbic Acid—Determination of, by Titration. In studying various methods for the titrimetric determination of ascorbic acid, McH. and G. found that a convenient and more accurate method was that of Harris and Ray with the following modifications: (*a*) the 2,6-dichlorophenolindophenol indicator was fairly stable when made up in phosphate buffer solution, p_H 7.2, but still required daily standardization; (*b*) the indicator was standardized against ferrous ammonium sulphate by the Tillmans, Hirsch and Jackisch method; (*c*) acid alone slowly decolorized the indicator, so 1 cc. of the indicator solution was diluted with 15–20 cc. of distilled water just before

titration with the acidified ascorbic acid extract, this considerably prolonged the time for decolorization of the indicator by the trichloroacetic acid but had little effect on the time for decolorization by ascorbic acid; (*d*) with solid foods, three extractions with trichloroacetic acid were required to obtain an estimate of the total amount of ascorbic acid; (*e*) a 3% final concentration of trichloroacetic acid was as effective for extraction as 5% acid and had considerably less destructive action; (*f*) a few drops of potassium cyanide solution added during extraction stabilized the ascorbic acid present; (*g*) for extraction of tissues, 48 cc. distilled water, 12 cc. 20% trichloroacetic acid solution and 1 cc. 0.2*M* potassium cyanide solution were added to 72 Gm. of the solid material, the mixture was ground with sand and centrifuged, the residue extracted twice in the centrifuge cups with 40 cc. of 3% trichloroacetic acid solution containing a little potassium cyanide solution, the combined supernatant liquids well mixed, the volume measured, the required amount filtered off and the filtrate titrated from a 5-cc. burette into a measured volume of the indicator solution. In the case of interfering pigment from cherry, raspberry, beet, etc., the Tillmans, Hirsch and Jackisch method was suitable and was based on the fact that most plant pigments are insoluble in chloroform while the indophenol indicator is more soluble in chloroform than in water. Strawberry and red pepper pigments were soluble in chloroform but could be removed by shaking up the trichloroacetic acid tissue extract with butyl alcohol or amyl alcohol. Heating or acid hydrolysis of some vegetable such as cauliflower gave an increased titration value probably due to liberation of ascorbic acid from a compound solution in water but insoluble in trichloroacetic acid.—EARLE W. MCHENRY and GRAHAM MURRAY. *Biochem. J.*, 29 (1935), 2013; through *Squibb Abstract Bull.*, 8 (1935), A-1698.

Bismuth—Color Reaction of. The potassium salt of mercaptophenyldithiodiazolone is just as sensitive a reagent for bismuth as dimercaptothiodiazole (bismuthiol I). The limit of detection is 1.2 microgram bismuth; the limit of dilution 1:28,000.—J. V. DUBSKY and J. TRTILEK. *Chem. Obzor*, 9 (1934), 203 (in English 205); through *Chemical Abstracts*, 29 (1935), 2876.

Bismuth—Determination of, in Medicines. (1) Determination as bismuth chromosulphocyanide. Place the acid solution (nitric or sulphotartaric) containing between 0.1 and 0.02% of bismuth, in a glass-stoppered flask containing 4 or 5 glass beads, add with stirring 2 to 3 cc. of freshly prepared saturated solution of potassium chromosulphocyanide, when precipitation is complete add 5 to 6 drops of toluene, stopper, shake till the underlying liquid is transparent, filter, wash, place the funnel on the precipitation flask, dissolve by pouring sufficient (about 10 to 15 cc.) hydrolyzing liquid (prepared by diluting 1–2 cc. of alkaline tartrate Fehling solution to 5–10 cc. and just before use adding 0.5 Gm. potassium bromide) through the filter, and wash with a minimum of water; to the green-colored liquid add 15 cc. of concentrated hydrochloric acid and *M*/1 potassium bromate solution to persistence of free bromine, stopper, after about 1 min. add 1 Gm. of potassium iodide and titrate the liberated iodine with *N*/1 sodium thiosulphate; (cc. bromate solution — cc. thiosulphate solution) × 0.58 = mg. of bismuth in the sample. (2) Volumetric determination based on the hydrolysis of oxyquinolineiodobismuthate. The solutions required are: (*a*) 6.6408 Gm. potassium iodide dissolved in 2 l. of water; (*b*) 2.8536 Gm. of potassium iodate previously dried at 150° to 180° C. and dissolved in 2 l. of water; (*c*) 3.26% potassium cyanide; (*d*) dissolve 5 Gm. of oxyquinoline and 12.5 Gm. of tartaric acid in 20 cc. of hot 2*N* sulphuric acid, and after cooling dilute to 100 cc. To an aliquot (not greater than 20 cc.) of the acid solution (nitric or sulphuric) of bismuth in a 50-cc. volumetric flask add 2.5 cc. of solution *d* and 25 cc. of solution *a*, dilute to 50 cc., filter, collecting in a dry 250-cc. Erlenmeyer flask. To an aliquot add a mixture of 10 cc. of starch paste, 5 cc. of solution *c* and 5 cc. of concentrated hydrochloric acid; gradually add solution *b* (previously standardized against solution *a*) till the blue color produced at first changes to pale yellow; (cc. iodide solution — $^4/_3$ cc. iodate solution) × 1.045 = mg. bismuth in the portion of sample that was titrated.—J. G. CARRERO. *Farm. Moderna*, 46 (1935), 134–143; through *Chimie & Industrie*, 35 (1936), 44. (A. P.-C.)

Bismuth-Sodium-Potassium Tartrate Solutions. So-called complex bismuth tartrates have been of interest because of their use in the treatment of syphilis in place of arsenic compounds. A neutral solution containing bismuth in combination with tartrate and glycerin is easily obtained but just what the combination is is not known. It is possible to vary the proportions widely. The following is a typical procedure: Bismuth subcarbonate 15 Gm., water 25 cc., concd. nitric acid 25 cc. "Heat, but do not boil, until solution is complete and all carbon dioxide is expelled. Dilute to about 600 cc. but not to the precipitation point. Add ammonia water in slight excess.

Use litmus paper and have the mixture alkaline throughout. Collect the precipitate on a Büchner filter by suction, washing well to remove soluble salts. Dissolve 10 Gm. Rochelle salt in water to make about 25 cc. When the Rochelle salt is dissolved add 20 cc. of glycerin and heat to about 100° C. Do not boil. To the hot mixture add the bismuth precipitate and mix well. To this mixture add a 50% solution of sodium hydroxide, a few drops at a time, stirring continuously until solution is complete; to this solution add a pasty mixture of tartaric acid and water, a little at a time, until it just turns blue litmus red. No precipitation should occur at this point, but if it does—a drop or two of ammonia will usually clear up the precipitate. Add water to bring the volume up to 100 cc." Within quite a wide range all factors may be varied. Experiments are under way to determine whether a solid bismuth compound which is permanent and soluble can be separated.—A. H. CLARK. *J. Am. Pharm. Assoc.*, 25 (1936), 9. (Z. M. C.)

Camphor—Volumetric Determination of, by the Hydroxylamine Method. The methods published for the volumetric determination of camphor by hydroxylamine hydrochloride consist of carrying out the reaction in alkaline medium and determining the uncombined reagent by duplicate titration. V. and D. studied comparatively the influence of various neutralizing agents and established a direct method consisting of titrating in the presence of bromophenol blue the hydrochloric acid liberated by oximation. The proportions of reagents and the duration of operation were determined. The method was applied to various ketones of the camphor series.—ROBERT VANDONI and GERARD DESSEIGNE. *Bull. Soc. Chim., mem.* (5), 2 (1935), 1685; through *Squibb Abstract Bull.*, 8 (1935), A-1624.

Carbon Dioxide—Micro-Dumas Generation of. In the micro-determination of nitrogen rather than use two Kipp generators as a source of carbon dioxide, it is much simpler to generate it by heating Kahlbaum magnesite ($MgCO_3$) contained in the closed end of the combustion tube.—W. S. IDE. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 56. (E. G. V.)

Cocaine and Novocaine in Illicit Trade. This paper concludes the work by the authors on anæsthetics reported from time to time (PHARMACEUTICAL ABSTRACTS, 1 (1935), 295). The aim of the investigation was to find a method of examination which would show whether or not a substance contains l-ecgonine or its derivatives, even in very small quantities. In connection with illicit traffic it is desirable to have a rapid method of testing. Taking into consideration the high price obtained in illicit trade for cocaine it is unlikely that the latter will be met with, except very occasionally. Attention was therefore given to the detection of small amounts of cocaine in other anæsthetics. In the first place the numbing action on the tongue must first be established; if this is absent other work is superfluous, but if it is present attempts must be made to identify cocaine. The Stas-Otto method is of no value since all anæsthetics dissolve in the same extraction media. In their investigation the authors have tried as many anæsthetics as possible including those which in all probability are never likely to occur as substitutes of cocaine. This was done to insure that cocaine could not be mistaken either by physical or chemical test for other substances. It was found that many reactions ascribed to a single substance were often given by several, that is, these reactions proved to be group reactions. Since a large proportion of the substitutes for cocaine are primary amines the lignin test using a piece of newspaper proved very useful. Group reactions led to a rapid separation and from a macrochemical point of view, the following are important: (1) Saturated potassium dichromate + strong hydrochloric acid; separation into primary aromatic amines, benzoyl compounds and Pantocaine. (2) Weak solution of potassium dichromate + dilute hydrochloric acid which gives different results with anæsthetics containing the benzoyl group, while primary amines do not react. (3) Lignin for separating the primary aromatic amines into two groups. The Marquis and Denigès reactions, as well as those with ferric and mercuric chlorides, were also useful. Phenols are easily detected by the ferric chloride reaction as well as by the Marquis reaction, which also shows the presence of the benzoyl group when carried out at 120° in the Denigès apparatus. The separation of the benzoyl compounds to which cocaine belongs is the most difficult and in this case the determination of the physical constants, rotation and melting points, is of great importance. Identification of the acid residues is frequently an important factor. Since ecgonine contains no double bond and except the phenol group, no active groups, nothing much can be expected from macrochemical tests with half the anæsthetics containing the benzoyl group. Several microchemical studies were made. The most characteristic form was obtained with the platinum chloride double salt of cocaine which was clearly seen at a dilution of 1:8,000. When small quantities were used the large feathery crystals tended to break

down to the basic crystal type which formed the feathers and which the authors designate as "TEETH." No other anæsthetic gave this type of crystal. When dealing with mixtures the authors first tried to identify the basic substance. The chief basic substance was then separated from cocaine by making use of the solubility in water, alcohol and acid. Perchloric acid was used, which converts cocaine to a resinous substance from which the remainder may be washed with water. The resin may then be dissolved and identified with platinum chloride. The authors proved the reliability of their method by correctly analyzing ten unknowns prepared for them by a colleague.—C. OFFERHAUS and C. G. BAERT. *Pharm. Weekblad*, 72 (1935), 1411–1435 and 1443–1464. (E. H. W.)

Colorimetric Determination—Improvement in, by the Application of Photoelectric Measurements to the Duboscq Colorimeter. The personal factor in the evaluation of colors by the Duboscq colorimeter is eliminated by interposing below the prisms twin photo-electric cells of the barrier-film type, which has a spectral sensitiveness very similar to that of the human eye, and giving off an amount of electric energy that is proportional to the intensity of the light which it receives and that is sufficient to operate directly (without any auxiliary source of potential) the measuring instruments. The Bernheim-Revillon cell consists of a special iron plate acting as a support for the semi-conductors which, after appropriate treatments, are cathodically plated with an extremely thin coating of a precious metal alloy. The cells can be adapted to the colorimeter without modifying the instrument. Maximum accuracy is obtained when the concentration of the solution being tested is nearly the same as that of the standard with which it is compared.—G. BERNHEIM and G. REVILLON. *Ann. Fals.*, 29 (1936), 5–10. (A. P.-C.)

Copper—Iodometric Determination of. Adjustment of Hydrogen-Ion Concentration. In the Park method of determining copper in the presence of as much as 0.3 Gm. of iron and 0.2 Gm. of arsenic, the potassium biphthalate may be omitted without any appreciable effect on the accuracy or precision of the results. The addition of biphthalate has no material effect on the p_H of the solution. The p_H at the end-point is nearer 3.3 than 4.0 and yet the end-point is practically permanent. To insure complete oxidation of a sample containing sulphide, iron and arsenic, treatment with nitric acid alone is not sufficient. A double treatment with nitric and hydrochloric acids or a single treatment with the two acids followed by one with saturated bromine water is found necessary.—W. C. CROWELL, T. E. HILLIS, S. C. RITTENBERG and R. F. EVENSON. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 9. (E. G. V.)

Cumaric Acid—Analysis of Preparations Containing Derivatives of. Cumaric acid derivatives such as coumarin, daphnine, fraxine, etc., react in solution with ferric salts to give a greenish coloration changing to red or violet on addition of sodium carbonate, but this test is not sensitive except with concentrated solutions of the pure substance and so is of limited applicability. Coumarin, upon fusion with alkali and subsequent acidification yields salicylic acid which is identified by the characteristic color with ferric chloride. The best distinctive test, however, is the fluorescence of neutral and alkaline solutions of the compounds. Tables of values are included to show the degree of fluorescence and the color in daylight and by ultraviolet light. Maximum dilutions are given for ordinary observations and for tests in capillaries.—A. KUHN and G. SCHAFER. *Pharm. Ztg.*, 80 (1935), 1253. (H. A. M.)

Cyclopentadiene—Color Reaction for Detection of. Small quantities of cyclopentadiene can be detected as follows: One drop of the liquid to be tested is mixed with 1 cc. each of chloroform and glacial acetic acid and then treated cautiously with 2 or 3 drops of concentrated sulphuric acid. As little as 0.1 mg. of cyclopentadiene gives a distinct violet coloration. Some higher boiling terpenes give a similar coloration but only with acetic anhydride, chloroform and sulphuric acid.—B. N. AFANASIEV. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 15. (E. G. V.)

Ergosterol—Differentiation of, from Cholesterol. A mixture of three volumes of a 2% aqueous sodium selenite solution and one volume hydrochloric acid gives characteristic color reactions with ergosterol solution in chloroform when heated until the latter is evaporated and new chloroform is added. The reaction is obtained also with irradiated ergosterol and calciferol, but not with cholesterol.—VICTOR E. LEVINE and FRANCES M. MCKAY. *Proc. Soc. Exptl. Biol. Med.*, 33 (1936), 546. (A. E. M.)

Filix Mas—Assay and Determination of Freshness of. The problem of the determination of the freshness of a drug has not yet been satisfactorily solved. It is suggested that this may be possible by chemical methods—by the determination of enzyme activity, of hydrogen-ion concen-

tration or of the proportion of acids forming barium or other salts which are soluble in suitable solvents. In the case of *Filix mas* it is found that the apparent proportion of crude filicin is lower in the fresh drug, or in the fresh ethereal extract, than in old material. On keeping in the dark in well-closed partially filled vessels, the extract becomes resinified and sticky, and it is possible to isolate from it a resin giving a barium salt insoluble in ether. If the fresh rhizome is separated into green and brown portions, it is found that the extract from the green material is of a fatty nature; that from the brown portions is resinous and sticky, though apparently containing a higher proportion of filicin. Thus, on storage, the drug or the extract undergoes a progressive change with resinification and increase of crude filicin content. The course of the change may be followed by dissolving 5 Gm. of the extract in 30 cc. of ether and shaking with 100 Gm. of 5% baryta water. The aqueous layer is run off and the content of crude filicin in it determined by the usual method. The ethereal layer is filtered and the ether-soluble and ether-insoluble fractions are determined.—J. STAMM. *Farm. Notisbl.*, 44 (1935), 1; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 535. (S. W. G.)

Fluoride—a Method of Analysis for. Application to Determination of Spray Residue on Food Products. The estimation of fluoride by titration with standard thorium solution in the presence of sodium alizarin sulphonate as indicator has been studied. The most favorable procedure includes the use of the indicator at a concentration of $4 \times 10^{-5}\%$, in a total volume of 50 cc., titration to match a blank in which the end-point is taken at a very light pink shade and careful regulation of the p_H in both blank and sample, the most favorable p_H being 3.5. This latter condition is readily met by the use of the buffer system of sodium hydroxide and chloroacetic acid at a ratio of 0.5 and total concentration of $0.02M$. The dissociation constant of chloroacetic acid in 50% commercial alcohol has been found to be 2.8×10^{-4}. Sodium alizarin sulphonate in this alcoholic solution acts as an indicator for hydrogen ion over the p_H range 4.8 to 7.2 instead of 3.7 to 5.2 as in water. In a volume of 50 cc. an average accuracy of 99% has been secured with known amounts of fluoride ranging from 57 to 760γ (micrograms) of fluorine. With 5-cc. volumes approximately the same accuracy is possible with 6 to 90γ of fluorine.—W. M. HOSKINS and C. A. FERRIS. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 6. (E. G. V.)

Glycerol—Determination of Water in. Pure glycerol was prepared as follows: Dynamite glycerol was refluxed with a large volume of toluene for 16 hours, collecting the water in a Bidwell-Sterling type of moisture-receiving tube. A considerable amount of the water was removed in this way. The toluene was separated from the glycerol in a separatory funnel, and the glycerol placed in a 3-liter distillation flask having a 25-cm. (10-inch) unpacked fractionating neck. It was then distilled slowly at about 5 mm. pressure and collected in a receiver which permitted fractionation without interrupting the distillation. The first 25% of the distillate and a residue of about 15% were discarded. Only the middle cut was retained. The distillation was repeated twice and a final middle cut was collected, without exposure to the air, in stoppered sample bottles, which were sealed with paraffin until used. The specific gravity was first determined in the usual manner in a Walker-type pycnometer. Upon completion, a one-hole rubber stopper was slipped around the outside of the neck of the pycnometer in an inverted position. The capillary tube was now removed and the pycnometer quickly inverted over the mouth of a dry, tared Erlenmeyer flask, in which the inverted stopper fitted. As soon as the glycerol had been transferred, the pycnometer was removed and the flask carefully stoppered. Water and other impurities could now be added and their proportion determined by weight. The water found by the specific gravity determination on the purified glycerol was always included in the "calculated" water content of the sample. In order to remove samples for analysis, a Lunge pipette or a shortened 5-cc. pipette was used. In either case the pipette was introduced into the flask containing the glycerol through a rubber stopper, and filled by compressing a rubber suction bulb. In this way the glycerol was exposed to the atmosphere for a minimum of time, and no difficulty was experienced from this source. A new vacuum distillation method for the determination of water was devised. It is based on the removal of water from glycerol at 100° C. and 2 to 3 mm. pressure. The volatility of the glycerol is controlled by a reflux condenser, which separates these ingredients from the water vapor. The water vapor is absorbed in a desiccant and weighed. The method is applicable to crude and refined glycerol.—C. P. SPAETH and G. F. HUTCHISON. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 29. (E. G. V.)

Halibut Liver Oils—Characteristics of Some, of the 1935 Season. More than forty

samples of oil obtained during the 1935 season were examined by the authors of this paper and data is given and also a table of maximum, minimum and average values is compiled.

MAXIMUM, MINIMUM AND AVERAGE VALUES OF 46 SAMPLES

Vitamin A	Minimum	Maximum	Average
Blue value	495	6,300	1,810
Units per Gm.	18,700	211,300	58,620
Ratio $\frac{\text{Units per Gm.}}{\text{Blue value}}$	28.3	37.8	32.9
Vitamin D* units per Gm.	2,300	2,800	2,560
Sp. gr. at 15.5°/15.5°	0.924	0.929	0.9265
Refractive index, n_D^{40}	1.4709	1.4836	1.4739
Acid value	0.0	3.6	..
Saponification value	160.0	176.0	171.2
Iodine value (pyridine dibromide method)	115.0	131.0	121.4
Unsaponifiable matter, per cent	7.2	17.55	10.42
Iodine value of unsaponifiable matter	95.0	197.0	128.3
Iodine value of glycerides	111.0	133.0	120.2
Iodine value of non-vitamin A Iodine value of unsaponifiable matter	50.0	83.0	68.8.

* Determined on three bulked samples of the 46 batches. The Norwegian oils were kept separate and gave the lowest figure, *viz.*, 2,300.

Vitamin A was determined in every instance by means of the blue values and spectrographically. Graphs are drawn showing the relationship between the blue values and the iodine values of the whole oil as well as the iodine values of the unsaponifiable matter. Considerable irregularity in this relationship is shown among the oils of low potency. For the richer oils there is a slight rise in iodine value with a rise in vitamin A. The unsaponifiable portions of the oils showed more regularity in this respect.—NORMAN EVERS, A. G. JONES and WILFRED SMITH. *Analyst*, 61 (1936), 7–11. (A. H. C.)

Hashish—Application of Filtered Ultraviolet Light to the Detection of. The whole drug when exposed to filtered ultraviolet light acquires a brilliant brown luminescence tending to mahogany; the appearance of the powdered drug is not appreciably changed; the petrolic ether extract acquires a very decided greenish fluorescence. Fluorescence of the extract is prevented by shaking the solution with animal charcoal; when the solution is kept in an incompletely filled receptacle in diffuse light, fluorescence gradually decreases and finally disappears. Solutions of extracts in ether, acetic ether, chloroform, carbon tetrachloride, acetone and xylene exhibit the same fluorescence as in petrolic ether; in carbon disulphide it is somewhat olive colored. Exposure of the extract for 30 mins. to a temperature of 100° C., with subsequent re-solution, does not prevent fluorescence. Extracts of various products which are currently used as adulterants give either no fluorescence or a different fluorescence.—JOSEPH KHOURI. *Ann. Fals.*, 28 (1935), 582–584. (A. P.-C.)

Hypophosphites Official in the National Formulary—Assay of. The official methods of assay of ammonium, calcium, manganese, potassium and sodium hypophosphites are based on the argentometric determination of the phosphate formed by the oxidation of the hypophosphite. The method for iron is different. The hypophosphites and their preparations are extensively prescribed so it is important to have satisfactory assay methods. Proposed methods may be put into two main classes; those based on the determination of the phosphate formed by oxidation of the hypophosphite by acidimetric means or by variations of the molybdate method; methods involving the oxidation of hypophosphite to phosphate and the subsequent determination of the quantity of oxidizing agent consumed in the reaction. A large number of workers have found methods of the second class satisfactory. Oxidizing agents used include potassium permanganate, potassium manganate, bromine, iodine, potassium iodate, iodic acid, potassium dichromate and mercuric chloride. Several methods have been critically studied. The six N. F. hypophosphites

were assayed by the official methods and results were low except for iron. The results for manganese were very low. National Formulary methods were then modified to determine the cause of the low yields. Sodium acetate was used instead of zinc oxide. Results did not fully explain low yields by official methods but they were higher and indicate an improvement and they show that oxidation is complete by N. F. methods. For sake of comparison a method involving oxidation to phosphate and determination of phosphate by precipitation as magnesium ammonium phosphate from a hot solution was studied also. Necessary reagents and details of procedure are given: Results were a trifle high but the method is as accurate as any phosphate method and so has been used as a standard method of comparison for sodium, potassium, ammonium and calcium hypophosphites. This gravimetric method as finally developed gives accurate results and is recommended where large quantities of other salts are present. It still has the disadvantage of being indirect. In selecting standard methods for comparison, the N. F. method for ferric hypophosphite was chosen. This rapid iodometric method gives excellent results. The Bismuthate Method was selected for comparison for the manganese salt. Hypophosphites are oxidized to phosphate by permanganate in acid solutions. This reaction is a basis for two methods, one of which was studied. As given in the National Formulary Bulletin it was slightly modified. Detailed procedure is reported and results are tabulated. Figures are mostly above 100, probably because of side reactions and impurities. Bromine as oxidizing agent was tried, some modifications of earlier procedures being applied. It was found to be simple and rapid. Average yields from the different methods are tabulated for comparison. The authors give the following reasons for thinking the National Formulary methods unsatisfactory: "1. The methods are indirect ones, determining total phosphates rather than hypophosphites. 2. Although consistent results are obtained by the methods, all the results are low. 3. Some difficulty was encountered with the end-point in titrating the excess silver nitrate with 0.1*N* thiocyanate, a tendency for the end-point to fade being noted. 4. No provision is made for the volume occupied by the undissolved zinc oxide. 5. Although the actual determination of the phosphate is rapid, considerable time is involved in converting the salts to phosphates. 6. The method for ferric hypophosphite is not subject to these criticisms, since excellent results are obtained." The suggested modifications are an improvement for the following reasons: "1. Higher yields are obtained, which approach the theoretical as determined by the Gravimetric Method. These yields indicate that some sodium acetate is superior to zinc oxide as a buffer. 2. The methods are subject, however, to the criticisms listed in items 1, 3 and 5 under the National Formulary Method. 3. These methods may be used to replace the present official methods although the results are only partially satisfactory." The Permanganate Method is unsatisfactory because the time of standing is too long, results are too high and the method is not applicable to all of the official salts. The Bromine Method is very satisfactory because it is simple and rapid, only the iron salt taking more than two and one-half hours, the method is direct, it yields excellent results, it can be made to apply to all the official salts. The N. F. Method for assay of ferric hypophosphite gives good results. The Gravimetric Method is good though not applicable to manganese. The Bromine Method is suggested to replace the present National Formulary Method.—GLENN L. JENKINS and CHARLES F. BRUENING. *J. Am. Pharm. Assoc.*, 25 (1936), 19. (Z. M. C.)

Iodine—Determination of, in Biological Materials. A standard method for the determination of iodine in biological materials, which gives concordant results in the hands of different workers, is described. For milk, 40–50 cc. are allowed to stand for five or six days with 4 cc. of 10*N* potassium hydroxide, and the mixture is then heated on a water-bath until a homogeneous solution results, which is transferred to a pure nickel dish and evaporated nearly to dryness on a steam-bath. The residue is dried at 150–160° C. for one hour, heated to 400–420° C. for two hours and finally at 480–500° C. for one hour. After cooling, the mass is digested with 20 cc. of water for a few minutes on a steam-bath, decanted through a filter and the residue again extracted with sufficient water to make the total volume up to 40 cc. The filter paper is placed in the nickel dish, and 1 cc. of 10*N* potassium hydroxide is added, the whole is evaporated to dryness, heated to 150–160° C. for fifteen minutes and ignited at 480–500° C. for one hour. The residue is extracted as before, the filtrates being added to the previous one, and the combined filtrates are evaporated to dryness, heated at 150–160° C. for half to one hour, and at 480–500° C. for five minutes. The residue is dissolved in a little water, evaporated and again heated at 150–160° C., and at 480–500° C. for five minutes. The residue is dissolved in 25 cc. of water, digested on a steam-bath and

filtered, the filter being washed with two or three quantities of 3 cc. of $N/10$ potassium carbonate. The combined filtrate and washings are evaporated to dryness in a small recently ignited porcelain dish, dried at 150–160° C. for half an hour and finally ignited at 480–500° C. for five minutes. The alkaline mass is made into a smooth cream with about 2 cc. of water, and mixed with 1.5 cc. of absolute alcohol, and two further quantities of 5 cc. of alcohol are added, the mass being thoroughly mixed between each addition. The alcohol is then decanted into an ignited platinum dish, and the extraction is repeated with two further quantities of 5 cc. of alcohol, decanted separately. The extracts are treated with 0.15 cc. of $N/1$ potassium carbonate, and rapidly evaporated on a steam-bath under a dust cover in a current of nitrogen. The residue is dried at 150–160° C. for five minutes, and treated with 0.5 cc. of 0.8% potassium nitrate solution, and again evaporated under the same conditions. After drying at 150–160° C. for five minutes, the dish is heated at 480–500° C. for two minutes only, the residue is dissolved in 0.5 cc. of a 1% solution of sodium azide, and two cc. of water, and transferred to a small round-bottomed flask, washing the dish twice with 1 cc. of water. The solution is made just acid to methyl orange with $N/2$ solution of sulphuric acid by "spotting," a further 0.05 cc. of acid is added, followed by 0.2 cc. of saturated bromine water. The bromine is boiled off over a micro-burner, the solution being concentrated to 2 cc., and, after cooling, 0.1 cc. of $N/2$ sulphuric acid, 0.1 cc. of starch solution and 0.1 cc. of 2% potassium iodide solution are added, and the liberated iodine is titrated with $N/500$ sodium thiosulphate. For vegetable materials, 3–5 Gm. of the dry powdered material is treated with 3 cc. of $10N$ potassium hydroxide and 30–40 cc. of water is added. The mixture is digested on a steam-bath for two to three hours, the liquid is transferred to the nickel dish and the determination is completed as before. For blood, 10 cc. is treated with 20 cc. of water and 1.5 cc. of $10N$ potassium hydroxide heated for three hours on a steam-bath, and the determination completed as before. For iodine in drinking water, 2–5 liters is evaporated nearly to dryness, while being kept strongly alkaline to phenolphthalein, 2 cc. of a 20% sucrose solution is added, and the whole evaporated, dried at 150–160° C. and ignited at 480–500° C. for one hour. The ignited residue is extracted with hot water, the insoluble residue is rejected and the filtrate is treated as before. It is necessary frequently to perform blank determinations on the reagents, and a correction factor is applied, whereby 0.06 (V-v) microgram of iodine is added to the calculated result, where V is the final volume of the titrated solution of the determination, and v is the final volume of that of the blank expressed in cc. The preparation of the iodine free reagents is fully described. Methods are also given for the determination of iodine in oils and fats, water containing nitrates, materials containing sulphates or sulphur compounds, fish products and saline materials.—C. O. HARVEY. Medical Research Council, Sp. Rep., No. 201 (1935); through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 724. (S. W. G.)

Iodine—Determination of, in Iodized Salt. This determination is based upon the well-known reaction between chlorine and iodide with the production of iodate and further reaction of iodate with potassium iodide and hydrochloric acid. In applying these principles to the determination of iodide in table salt it was found that while perfect results could be obtained on solutions of iodide in distilled water, when salt is present in such relatively large amounts as it is in iodized salt the results obtained were far from correct. The amount of acidity had a very marked influence upon the liberation of iodine as shown by a series of experiments on solutions containing definite quantities of iodide and salt. A given quantity of the mixture requiring for titration when just faintly acid 5.3 cc. of $N/500$ thiosulphate required 0.4 cc. only of thiosulphate when 20 cc. of $N/1$ hydrochloric acid was added. The addition of as little as 2 cc. of $N/1$ hydrochloric acid decreased the volume of thiosulphate about 50%. In order to overcome this difficulty and otherwise improve the method the authors of this paper have worked out the following details which are shown to be entirely satisfactory: 100 Gm. of the salt are dissolved in water, the solution made up to 500 cc. and filtered. Two hundred cc. of the filtrate, representing 40 Gm. of the salt, are placed in an Erlenmeyer flask and made faintly acid to methyl orange, and 1 cc. of bromine water added. The solution is boiled until salt begins to separate, using a few fragments of calcite or pumice to prevent bumping. Sufficient water is then added to dissolve the salt, 2 cc. of normal hydrochloric acid added and the liberated iodine titrated with $N/500$ thiosulphate solution. The important point in this whole process seems to be the oxidation of the iodide to iodate in a solution that is practically neutral. If any considerable amount of acid is present the final result will be entirely too low.—R. L. ANDREW and J. L. MANDENO. *Analyst*, 60 (1935), 801–803. (A. H. C.)

Iodine—Determination of, in Kelp. The usual method of preliminary treatment of the kelp and liberation of the iodine with sodium nitrite and sulphuric acid and subsequently extracting the iodine with carbon disulphide and titration with $N/100$ sodium thiosulphate is reviewed. The accuracy of this method is not questioned but two objections are raised. *First*, the time required to eliminate sulphur is excessive, and *second*, the dangers involved in the use of carbon disulphide and the difficulties in the way of its recovery. Other methods were studied and finally the following was evolved. "The moisture-content of the crude sample is determined by drying 26 Gm. to constant weight in a water-oven. The sample is then ground to pass a 30-mesh sieve and the moisture again determined. Depending on the humidity of the atmosphere, there is either a gain or loss in moisture in the grinding. Twenty grams of the finely ground sample are gently boiled with 200 cc. of water for half an hour, the extract is filtered into a 500-cc. graduated flask, the residue is washed with hot water and the filtrate is made up to 500 cc. Fifty cubic centimeters (= 2 Gm.) are transferred with a pipette to a beaker, diluted with water to approximately 400 cc., and 10 cc. of 30% acetic acid and about 1 cc. of liquid bromine are added. The solution is boiled until it has only a slight yellow color, and then cooled. About 0.5 Gm. of pure phenol, dissolved in a few cc. of glacial acetic acid, is added, followed, after the lapse of at least 2 minutes, by an excess of potassium iodide solution, and the mixture is titrated with $N/20$ sodium thiosulphate solution, with starch as indicator. The $N/20$ sodium thiosulphate is standardized against 0.030 Gm. of dried Analar potassium iodide, treated in the same way, and the quantity of iodine is calculated by direct proportion to the original moisture-content of the kelp."—J. B. McKEAN. *Analyst*, 61 (1936), 11–13. (A. H. C.)

Iron—Determination of, in Biological Materials. A colorimetric method for the determination of iron in biological materials is described, and a summary of the existing methods is appended. For the determination, an accurately weighed sample of the substance under test containing about 0.01–0.02 mg. of iron is dried at 105° C., and, if of a glandular or muscular nature, mixed with 1 Gm. of iron-free calcium carbonate, and the dried material ignited in a furnace until a white or gray ash remains. To the ash, 4 cc. of redistilled hydrochloric acid, plus an additional amount equivalent to any calcium carbonate previously added, and 10 cc. of water are added, and the mixture is heated to boiling, allowed to stand over night and rinsed into an Erlenmeyer flask. If this solution contains more than 0.01 mg. of iron, to an aliquot portion is added about 4 cc. of hydrochloric acid, and water to make about 200 cc.; if not, the whole solution is diluted to about 200 cc. The solution is boiled for at least thirty minutes, until reduced to 10 cc., and, while still hot, one drop of iron-free nitric acid is added. The solution is cooled, transferred to a stoppered test-tube and made up to about 25 cc.; 5 cc. of a 20% solution of potassium thiocyanate and 5 cc. of isoamyl alcohol are added, and the liquids are mixed gently until there is no color in the aqueous phase. The color of the alcoholic solution is compared in a colorimeter with that obtained from a mixture of 0.1 cc. of a 0.07% solution of pure ferrous ammonium sulphate, equivalent to 0.01 mg. of iron, 2 cc. of hydrochloric acid and one drop of nitric acid. This solution is boiled, cooled, made up to about 25 cc. and, after the addition of the thiocyanate, is extracted with isoamyl alcohol as before. From the results obtained the amount of iron in the substance under test may readily be calculated. Directions are given for the preparation of the iron-free reagents used in the determination.—G. E. FARRAR. *J. Biol. Chem.*, 110 (1935), 685; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 726. (S. W. G.)

Lactose—Tests for Purity of. The following is a very delicate test for the detection of minute quantities of high molecular compounds (albumen, starch, etc.) in lactose. Twenty cc. of a solution of the lactose is mixed with 10 cc. of a suspension of 9 Gm. of kaolin in 100 cc. of $5M$ sodium chloride solution, and 25 cc. of the mixture is transferred to a cylinder of 1.17-cm. diameter. A series of such mixtures is made, starting with a nearly saturated solution of the lactose ($0.4M$), and continuing with more dilute solutions. The mixtures are kept at 20° C. for one hour, when the height of the turbid layer in each tube is noted. In the case of pure lactose this height shows little variation, being slightly higher in the more concentrated solutions; the presence of traces of starch or albumen causes the height of the suspended layer to be much lower in the more concentrated solutions.—H. WERNER. *Z. Unters. Lebensm.*, 67 (1935), 298; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 537. (S. W. G.)

Leucine and Tyrosine—Analysis of, in the Urine. In healthy urine only traces of amino-acids can be detected, usually glycocoll. The development of a suitable test for leucine and tyro-

sine which are known to occur in the urine in pathological conditions would offer a useful diagnostic method. Methods of detection and of isolation of both tyrosine and leucine are outlined and the microscopical examination of the crystals described.—FISCHER and H. STRALLER. *Pharm. Ztg.*, 81 (1936), 38. (H. A. M.)

Liquid Petrolatum—Evaluation of a Deterioration Factor in. Mineral oils on the market now are more stable than any oil offered a few years ago but among them are oils meeting U. S. P. requirements which after several months' standing show disagreeable odors. Testing samples by storing them at an elevated temperature for a long time is a sure method but it is time-consuming and consequently impractical. The U. S. Phar. and the British Phar. have required that it shall not impart more than a pale brown color to a layer of concentrated sulphuric acid after heating for *ten* minutes at 100° C. with frequent agitation. The depth of color roughly measures the amount of carbonizable substance present. These books have also required that a mixture of the oil, absolute alcohol and sodium hydroxide solution saturated with lead oxide remain colorless after heating at 70° C. for ten minutes. This test indicates the absence of sulphur which is a common impurity in some petroleums. The British Phar. requires also that the oil must volatilize when heated on platinum foil without giving off acrid vapors. These tests are not delicate enough. American oils, being saturated hydrocarbons of the methane series, are more stable than the Russian oils which are hydrocarbons of the benzene series or naphthenes. The U. S. P. and B. P. tests which served for the Russian oils are inadequate for the saturated paraffins of America. Spectroscopic examinations give good results but spectroscopes are not common enough to make their use practicable. An oxidation method has been used, also exposure to sunlight and ultra-violet light. In the experimental work reported, a simple aging test and an oxidation test only distinguished very good oils from very poor. Then oils were subjected to twenty pounds of steam pressure for one hour. This method was rapid but is not entirely dependable for the personal element enters into any odor test. A fourth test measured colorimetrically the quantity of peroxides developed after heating for 40 hours in a steam-bath at 211° F. The reagent consisted of aqueous and acetone solutions of ferrous sulphate, ammonium sulphocyanate and sulphuric acid. When the oil is shaken with the reagent the peroxides convert ferrous ions to ferric and these combine with the sulphocyanate to give a dark red color. The length of time makes this method impractical. The authors then combined the idea of heating under twenty pounds of steam pressure for one hour with that of measuring the peroxides developed, by testing with the ferrous sulphate and ammonium sulphocyanate reagent. They have called this the Accelerated Peroxide Method Index and it is significant that the odor tests either with dry heat or steam closely parallel the new method. Details of procedure follow: "Solution A is made by dissolving 10 Gm. of ferrous sulphate in 500 cc. of distilled water to which has been added 10 cc. of concentrated sulphuric acid and 1 Gm. of potassium sulphocyanate. (Use glassware cleaned with chromic acid and be certain to use uneffloresced crystals of ferrous sulphate, and sulphocyanate.) After the ferrous sulphate has dissolved add 1000 cc. of commercial acetone. Filter the acetone if taken from a can to insure against contamination with rust. The resulting solution is gently refluxed on a steam-bath in the presence of clean iron wire, and it is protected from oxygen by introducing a stream of nitrogen or carbon dioxide into the top of the refluxing condenser. Be certain the iron wire has no minute rust spots. If doubtful get new wire or rub down the questionable wire with sandpaper. Use a cork covered with heavy tinfoil between the flask and condenser while refluxing. Protect this reagent from air by keeping the containers filled with carbon dioxide or nitrogen. The colorless solution is stored in sealed, hard glass bottles containing a piece of clean iron wire. It is well to rinse the bottle with a small amount of the reagent before filling. Caution should be used in handling the sealed bottles of test solution A, and the testing solution, since considerable pressure develops in storage. It is recommended that stored bottles be not more than one-half to two-thirds full. Solution B is made by dissolving 10 Gm. of potassium sulphocyanate in 500 cc. of distilled water. The testing solution consists of three volumes of solution A and one volume of solution B. Store in a hard glass bottle containing a small piece of clean iron wire. Here again do not allow the solution to come in contact with the air. This solution is ready to use when it is colorless or possesses a slate-gray cast. Oftentimes the solution is tinted when first mixed but becomes colorless upon standing for a few hours. *Test Method.*—"Add 100 cc. of the oil to be tested to a screw-capped, wide-mouth, 8-ounce jar with the entire paper liner removed from the cap. Place the jar in an autoclave after making certain that the screw cap is adjusted very loosely

so that steam may enter the bottle. Adjust the steam pressure to twenty pounds, maintaining it for one hour, then remove the sample from the autoclave and allow it to cool. Wipe the moisture from the inside of the cap. Add 10 cc. of the sample to a 10-cc. graduated test-tube, then pipette in 5 cc. of the colorless testing solution. (Be certain to replace the air in the test-tube and in the bottle of testing solution with carbon dioxide or nitrogen.) Tightly stopper with a new cork and shake for thirty seconds, then allow the aqueous layer to separate. If the aqueous layer is colorless, the oil contains no peroxides. A pink or red color in the aqueous layer shows the presence of peroxides. A control of 10 cc. of liquid petrolatum and 5 cc. of the colorless testing solution should always be set up." The authors summarize by saying that peroxides that would form by aging can be developed quickly and measured according to the procedure reported. The rapidity of normal deterioration is indicated roughly by the amount of peroxides formed.—P. L. BURIN, A. G. WORTON and F. E. BIBBINS. *J. Am. Pharm. Assoc.*, 25 (1936), 27. (Z. M. C.)

Low-Boiling Liquids—a Convenient Form of Glass Apparatus for Handling. A heavy-walled glass vessel of the type used for soda-water syphons is used as the container. A brass cap fits over the neck of the bottle and is cemented in place, using a cement consisting of equal parts by weight of red lead and litharge made into a stiff paste with glycerin. The cap is threaded to take the desired valve assembly.—S. F. BIRCH and P. DOCKSEY. *J. Soc. Chem. Ind.*, 55 (1936), 169. (E. G. V.)

Luminescence Analytical Studies in Drugs. Numerous drug extracts which do not fluoresce in ultraviolet light exhibit this property upon the addition of suitable reagents. The luminescence spot-tests are simple to carry out. One drop of the drug extract, instead of the one-cc. volume by the Grosbüsch technique, is placed on filter paper, dried and the different spot-tests then undertaken under the quartz lamp. It is supposed that, in using larger volumes of liquid, important substances become concentrated around the border of the spot by capillary action. The reaction noted will depend, therefore, upon whether the reagent is applied to the middle or the edge of the spot. The reactions differ also on dry and wet spots, and in some instances do not become evident until the spot has become dry. The spot method of analysis is superior, in the opinion of the author, to analytical methods based upon the formation of capillary figures which are frequently very difficult to describe. By the spot method, usually but one color appears, although several ring-shaped zones may be formed. The inner zone is always the larger of the two. With large spots color phenomena are always seen in the outer zone owing to the presence of iron in the filter paper or perhaps to the carbohydrate. In smaller spots this color is less likely to be noted. As reagents, 10% sodium hydroxide is to be preferred to other bases, although ammonium hydroxide is recommended in certain isolated instances; the acids are diluted sulphuric acid and sometimes diluted acetic. Aluminum sulphate is applied in the form of a saturated solution. Tables are given showing the fluorescence produced on numerous drug extractives by sodium hydroxide, hydrochloric acid, aluminum sulphate, borax and calcium cyanide. Special identification tests are discussed, *viz.*, aluminum with morin; aloes with borax; boric acid with coccionella and with aloes; detection of gambir and ammoniac.—P. W. DANCKWORTT. *Arch. Pharm.*, 274 (1936), 184. (L. L. M.)

Magnesium Citrate—Modified Assay for Solution of. An assay was introduced into the U. S. P. IX and it has been continued with little change, though unsatisfactory in several ways. Evaporation to dryness and charring of organic material before precipitation mean loss unless extreme care is exercised. Then there is a long period of standing followed by drying and ignition. Various suggestions for simplification have been made and one has been accepted as part of the assay for U. S. P. XI. The original sample is diluted and acidified and precipitated without drying and charring. A method which determines the magnesium as magnesium ammonium phosphate hexahydrate involves precipitation in the usual manner, filtration and washing with dilute ammonium hydroxide, alcohol and ether on a Gooch crucible, drying and weighing. The method is more rapid, less tedious, more easily carried out and there is no black residue. Comparison with the U. S. P. method shows little deviation.—W. F. REINDOLLAR and H. E. CHANEY. *J. Am. Pharm. Assoc.*, 25 (1936), 95. (Z. M. C.)

Mercuric Chloride—Determination of, in Pastilles. Dissolve one pastille in water and bring to a definite volume. Place an aliquot portion of this in a centrifuge tube and add ammoniacal dichromate solution (5 cc. 20% ammonia and 50 cc. *N*/10 potassium dichromate). Centrifuge the precipitate; wash a few times with distilled water and take up in a concentrated solution

of potassium iodide or of sodium thiosulphate and titrate the alkali. The reactions follow the following equations:

$$8HgCl_2 + K_2Cr_2O_7 + 18NH_4OH \rightarrow 2(Hg_2N)_2CrO_4.2H_2O + 2KCl + 14NH_4CL + 13H_2O$$
$$(Hg_2N)_2CrO_4.2H_2O + 16KI + 6H_2O \rightarrow 4K_2(HgI_4) + (NH_4)_2CrO_4 + 8KOH$$
$$(Hg_2N)_2CrO_4.2H_2O + 8Na_2S_2O_8 + 6H_2O \rightarrow 4Na_2(Hg(S_2O_3)_2) + (NH_4)_2CrO_4 + 8NaOH.$$

—S. AUGUSTI. *Scienza del Farmaco* (1935), 21; through *Pharm. Weekblad*, 72 (1935), 1339. (E. H. W.)

Mercury—Accurate Separation of Precipitated Mercuric Sulphide and Sulphur in the Gravimetric Determination of. Collect the precipitated mercuric sulphide in a weighed glass or porcelain filtering crucible, wash with cold water, dry thoroughly at 110° C. and weigh. Replace the crucible in the holder without turning on the suction pump, and add cold stabilized constant-boiling hydriodic acid in the proportion of about 5 cc. for each Gm. of precipitate. Stir the mixture with a glass rod until all black particles of mercuric sulphide have disappeared, then turn on a gentle suction and draw the solution from the crucible. Wash the residual sulphur first with three or four successive 5-cc. portions of dilute (5 to 10%) hydriodic acid and then with cold water. Water must not be used for the initial washings because of the danger of decomposing the soluble mercury complex, thus precipitating mercuric iodide in the pores of the filtering disk. Dry the crucible and its contents for about 2 hours in a vacuum desiccator and reweigh. The difference in the two weighings gives the amount of pure mercuric sulphide present.—E. R. CALEY and M. G. BURFORD. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 43. (E. G. V.)

Morphine—Assay for, Content of Poppy Plants Grown in Denmark. The crop of poppy reported by Baggesgaard-Rassmussen and Salomonsen (*Dansk Tids. Farm.*, 10 (1936), 1) from Danish cultivation was assayed for morphine by essentially the method of the 1933 Dan. Phar. for morphine in Tetrapon. The accuracy and optimal conditions of the assay were studied. The weight loss in drying, ash content and nitrogen by Kjeldahl are also reported. The *capsules* free from seed were 30% of the crop, weight loss on drying 12.7%, ash 11.4%, N 1.47%, morphine 0.35%. The *stems* were 25% of the crop, loss in drying 9.4%, ash 4.2%, N 0.88%, morphine 0.15%. The *rest* of the plant was 45% of the crop, loss on drying 11.6%, ash 10.4%, N 1.57%, morphine 0.20%. On the *entire* plant, loss on drying 10.7%, ash 8.5%, N 1.34%, morphine 0.25%. An attempt to identify the morphine *via* the Reinecke's salt failed, but the precipitation with dinitrochlorobenzol by Mannich's method gave results agreeing with the gravimetric assay.—J. C. JESPERSEN. *Dansk Tids. Farm.*, 10 (1936), 16. (C. S. L.)

Mucilaginous Drugs—Determination of, by Means of Their Aqueous Extracts. The drug under consideration in this paper is tragacanth. The viscosities are determined with an instrument operating on the principle of the Ostwald capillary viscosimeter. The literature on the viscosity of tragacanth solutions is reviewed. The effects of the following factors on the viscosity of a decoction are determined: filtration of a 0.05% decoction through single and double filters while hot, the same after cooling, dilution of a concentrated extract to 0.05%, the period of heating on a water-bath, the period of heating on an open flame, the degree of fineness of the tragacanth used and the method of drying of the drug previous to use. A method of maceration is investigated as to the following factors: time of maceration, degree of fineness of the powder, filtration through cotton, dilution of stronger extracts, the method of drying of the drug, filtration through double filters. The following method is suggested for the determination of tragacanth: powder 10 Gm. of tragacanth to pass through a No. 5 sieve. Scatter 0.05 Gm. of the powder on the surface of 100 cc. of water in a tall cylinder. After allowing the powder to become wetted, shake vigorously and let stand 20 to 24 hours. Shake thoroughly again and pass through a rapid filter paper. The resulting solution must have a relative viscosity of at least 1.40.—E. WALDSTÄTTEN and H. FEUER. *Scientia Pharm.*, 7 (1936), 1. (M. F. W. D.)

Nitrogen—Kjeldahl Method of Determination of. Substances containing two nitrogen atoms joined together, *e. g.*, cardiazol (pentamethylenetetrazole), phenazone and amidopyrine, gave results for nitrogen content by the Kjeldahl method which were 30% or more too low. Quinine hydrochloride, caffeine and nicotine gave satisfactory results. The combustion was carried out with 1 Gm. of copper sulphate, 0.75 Gm. of mercuric sulphate, 10 Gm. of potassium sulphate and 20 cc. of a mixture of equal parts of concentrated and fuming sulphuric acid.—H.

HAUGEN. *Norsk farm. Tidsskr.*, 43 (1935), 82; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 540. (S. W. G.)

Opium Analysis—Detailed Acid Hydrolysis Method for. This method may be applied to any opium, any part of the opium poppy plant and opium refuse, and to most all pharmaceutical preparations containing traces or large quantities of morphine. The method suggested is claimed to be accurate and rapid.—G. E. MALLORY and PETER VALAER, JR. *Am. J. Pharm.*, 107 (1935), 515. (R. R. F.)

Opium—Assay of, by the Method of Mannich. The author discusses the method of Mannich as compared with that of the Belgian Phar. and the International Method. He obtained the following results with a typical sample of opium:

	I	II
Method of Mannich	11.4 %	11.2 %
International Method	10.39%	10.41%
Method of the Belgian Phar.	9.77%	10.05%

The author rather favors the method of Mannich as convenient to carry out for the pharmacist.—A. MAUDENS. *Pharm. Tijdschrift*, 13 (1935), 148. (E. H. W.)

Opium Assay. Observations on report are made of some studies of assay methods, especially the Helfenberger and the lime methods. Though the lime method is favored there has been contradictory criticism. The criticism that seems most prevalent is that there is loss of morphine in the solvents used. Some pharmacopœias meet this by using a "correction" equivalent to about 8% of the morphine present. A comparison of results by the British Phar., which used a correction, the U. S. P. without a correction and the German Phar. which is of the Helfenberger method is shown in a tabulation. Because the basis for the magnitude of the correction seemed obscure, a study of the methods was undertaken. Experimental work was carried out on morphine by U. S. P. and B. P. methods and modifications of each. Adsorption of morphine on lime was studied. Reduction of lime increased recovery of morphine but adsorption was not sufficient to account for all the loss. Ammonium chloride was reduced since it is known that some alkaloids react with ammonium salts. It was found that ammonium chloride holds about 2% of the morphine in solution in the U. S. P. assay. Ammonium sulphate has a lesser solvent effect. Repetition of assays gave such divergent results that temperatures were suspected. It was found that a 10° difference may cause a variation of 1%. Other alkaloids, notably codeine, are co-precipitated with morphine. Experiments on a "composition opium" were made, results being higher than with morphine alone. Saturation of morphine-lime solution with sodium chloride gave a higher percentage of morphine precipitated. Several samples of opium were tried by methods similar to those for morphine alone. Results are tabulated and discussed. A table shows the amounts of co-precipitated alkaloids. New assay methods by immiscible solvents have two advantages, no correction for solubility of morphine is necessary and isolated morphine is not contaminated with non-phenolic alkaloids though phenolic ones may be present. These methods have one great disadvantage in that the very small amount of morphine which can be used cannot be representative of the opium. The following summary by the authors covers their conclusions very well: "Dissolving the morphine, obtained in the lime assays, in hot methanol before titration eliminates, on the basis of the morphine contents, about 2% of foreign titratable substances calculated as morphine. Assays of pure morphine by the U. S. P. and B. P. methods confirm the 'assay-loss' of practically 1 mg. of morphine of each cc. of lime-morphine solution as indicated in the latter Pharmacopœia. This 'loss,' however, will fluctuate somewhat unless definite and uniform conditions are maintained in the assay. About one-half of the assay loss is attributable to the solubility of morphine in the assay solvents. The greater part, if not all, of the balance of the 'loss' is caused by the solvent action of the ammonium chloride on morphine. Adsorption on the lime may also be responsible for a small portion of the assay loss. It therefore follows, and it has been confirmed by experiment, that the larger the quantity of ammonium chloride used the greater will be the quantity of morphine dissolved. By using 0.5 Gm. of ammonium chloride in the U. S. P. assay, 1 to 1.5% more morphine was precipitated than when 1 Gm. was used. The temperature during precipitation of the morphine in the lime assays affects the quantity of morphine held in solution. When precipitation takes place at 28–30° C. about 2% more of the morphine is dissolved than at 8° C. We attribute the increased solubility largely to the greater solvent action of

the ammonium chloride at the higher temperature. It is recommended: (1) that in the U. S. P. assay 0.5 Gm. of ammonium chloride be used instead of 1 Gm. This quantity, 0.5 Gm., is several times the theory of a 15% opium; and (2) that the temperature of precipitation (standing over night) be restricted to about 10° C. Saturation or near-saturation of the lime-morphine solution with sodium chloride before adding the ammonium chloride raises 1 to 2% the quantity of the morphine precipitated. In the case of opium, however, the use of sodium chloride will also increase the co-precipitation of the by-alkaloids. The morphine precipitated in the U. S. P. and probably also in other lime assays carried about 3% non-phenolic by-alkaloids which is included in the assay as morphine. Since opium contains also other alkali-soluble alkaloids than morphine, these, if present in appreciable quantities, may also be included with the morphine and thus show an apparent higher morphine content. Pharmacopœias applying a correction for 'assay loss' should, as a matter of scientific accuracy and of fairness to the manufacturers of morphine and its derivatives, who consume 90% or more of the total legitimately used opium, take cognizance of the occlusion of by-alkaloids in the morphine and make the necessary correction. By coincidence of counterbalancing error factors, the U. S. P. assay of opium appears to indicate very closely the true morphine content. The 'total extraction' of the opium which has been practiced in the assay by the several revisions of the U. S. P. is an important point in its favor. It obviates errors in aliquot portions due to the variable amounts of water and insoluble matter in the opium. In the assay method under consideration by the Committee of the League of Nations, published elsewhere, these sources of 'inaccuracies' are corrected for by making separate determinations of the water content of the opium, and of the total extractive matter. Corrections, almost of any kind, are looked upon with disfavor in analytical procedures. They are most uncertain and most undesirable when the corrections involved are of appreciable magnitude. Assays based on the isolation of the morphine, free from by-alkaloids, through the use of immiscible solvents offer a possible solution of the problem provided they can be worked with reasonably large samples. They should also strive to avoid such aliquots as may introduce any element of error, and, *ipso facto*, should not require an undue length of time."—JOSEPH ROSIN and C. J. WILLIAMS. *J. Am. Pharm. Assoc.*, 25 (1935), 1053. (Z. M. C.)

Psyllium—Determination of Swelling Factor of. A tentative method was adopted. One gram of psyllium seeds is placed in a 50-cc. graduated cylinder fitted with a one-hole rubber stopper with a glass stirring rod inserted through the hole. Water is added to the 20-cc. mark and the mixture well stirred. The cylinder with the contents is placed in a refrigerator (5–10°) for twenty-four hours and stirred at frequent intervals. After removal of the cylinder, the contents are again stirred and allowed to settle at room temperature until no further change in volume is noted.—*J. Assoc. Official Agr. Chem.*, 19 (1936), 104. (G. S. W.)

Pycnometer—a Precision, for Liquids. The pycnometer, 16.25 cm. long, is made of capillary tubing (4-mm. outside diameter and 0.75-mm. inside diameter), and has a bulb of any desirable size blown at the center; a ground glass cap fits over the bottom and a stop-cock is connected at the top. The liquid reservoir is a test-tube long enough to allow the pycnometer, with cap removed, to touch the bottom and to just allow the stop-cock to turn. A thin rubber stopper supports the pycnometer in the reservoir. The pycnometer is easily thermostated, has minimum loss at the ground glass joints due to evaporation, and there is no loss of liquid during filling, permitting the handling of expensive liquids.—S. T. YUSTER and L. H. REVERSON. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 61. (E. G. V.)

Santonin—Determination of, in Santonica. A tentative method was adopted. Three grams of ground sample are extracted with benzene in a Soxhlet apparatus or automatic percolator for three hours. The extract (about 100 cc.) is shaken vigorously for five minutes with 35 cc. of 8% sodium carbonate solution in a separator. The aqueous layer is transferred to a second separator. The combined aqueous extracts are shaken with 10 cc. of benzene, the aqueous layer discarded and after washing the benzene it is added to the benzene in the first separator. The combined benzene extracts are filtered through cotton, evaporated to dryness and the residue treated with 5 cc. of alcohol while warming. Sixty cubic centimeters of saturated barium hydroxide are added with stirring, the mixture heated to boiling on a steam-bath for ten minutes and filtered into a separator. After washing with two 10-cc. portions of barium hydroxide solution, 6 cc. of hydrochloric acid (2+1) are added to the filtrate. After cooling the filtrate is extracted with 25-, 15-, 10- and 10-cc. portions of chloroform, filtered through cotton and the filtrate evaporated to dryness.

The residue is dissolved in 25 cc. of alcohol by warming and mixed with 50 cc. of dinitrophenylhydrazine sulphate solution and assayed by the usual method for santonin. (*J. Assoc. Agr. Chem.*, 18 (1935), 87).—*J. Assoc. Official Agr. Chem.*, 19 (1936), 104. (G. S. W.)

Sea Water Damage—Testing for. The damage done by sea water can usually be detected by simply treating the material with water and showing the presence of chloride with silver nitrate in the usual way. The problem as discussed is applied to a great variety of materials such as copper and galvanized wire, bristles, sugar, cocoa beans, gum arabic, prunes, walnuts, sheep's wool, carpets, etc. As a means of positive proof that damage is done by sea water and not to contamination by other liquids which might contain chloride, the author takes advantage of the fact that bromide is always present in sea water. He describes a special apparatus in which the bromine is liberated by chromic acid and then brought in contact with a paper moistened with alcoholic solutions of fluorescein of about 0.2% strength. The final quantities of material recommended is 1 cc. sea water diluted to 2 cc. with water and 5 cc. of a chromic acid solution containing 150 Gm. of acid in 80 cc. water. 0.1 cc. of sea water was found to correspond approximately with a 0.001% potassium bromide solution. If a series of standard stains is prepared from potassium bromide the test can be made approximately quantitative and the relation between chloride and bromide determined. The authors show this relationship to be about 1–280 which corresponds closely to published data. Consideration is given to the application of the method to organic material and when various interfering things are present and other possible difficulties. Of special interest is the statement that the author found bromine in coconut fibre once in four samples and the white edible portion of the nut not once while the milk showed both bromine and chlorine in every case. The curious fact is also noted that after fermentation no bromine could be found in the milk. No explanation of this phenomenon is offered.—W. M. SEABER. *Analyst*, 61 (1936), 14–22. (A. H. C.)

Sodium Salicylate and Bicarbonate—Coloration of Solutions of. The Benkema-Goldsmith Method is far from ideal because the introduction of small amounts of calcium in the salicylate solutions causes the formation of a calcium carbonate precipitate. The use of dilute hydrochloric acid (which liberates a small quantity of salicylic acid) as neutralizing agent offers undoubted advantages.—J. J. RIVAS GODAY. *Bol. Farm. Militar.*, 13 (1935), 101–108; through *Chimie & Industrie*, 34 (1935), 1368. (A. P.-C.)

Sodium Thiosulphate—Stabilization of Standardized Solutions of. The instability of standard sodium thiosulphate is attributed to use of unboiled water, traces of copper in the water, bacterial action, effect of light, etc. Attempts to prevent the change were made by adjusting p_H with borax and soda to 9.5, but the alkali was found to combine with free iodine in neutral solution and result in low iodine values.—P. HORKHEIMER. *Pharm. Ztg.*, 80 (1935), 1330. (H. A. M.)

Sulphosalicylic Acid—Melting Point of. S. shows that this acid has the formula C_6H_3(OH(1))(COOH(2))(SO^3(6)).$2H_2O$, molecular weight 254.15, as originally stated in the D. A. B. V., loses its water of crystallization upon short drying in a drying oven and in time in a desiccator (over sulphuric acid), which it again takes up quantitatively in the air after a short time. The melting point depends upon the water content since the water-free substance melts indefinitely with decomposition at 200–225° C. and the air-dried substance melts at 108–113° C. and is stable.—KONRAD SCHULZE. *Apoth.-Ztg.*, 51 (1936), 319–320. (H. M. B.)

Theobromine—Determination of, in Theobromine Calcium. A tentative method was adopted. About 0.5 Gm. of material is dried at 110° to constant weight. 0.2 Gm. of the dried material is added to a 100-cc. volumetric flask, 2 cc. of glacial acetic acid is added and the mixture warmed on a steam-bath. Boiling water is added with shaking until solution takes place (about 10 cc.). After cooling to room temperature 50 cc. of 0.1*N* iodine, 20 cc. of saturated salt solution and 2 cc. of hydrochloric acid are added and after shaking made up to volume with water. After standing over night the solution is filtered and 50 cc. of the filtrate titrated with 0.1*N* sodium thiosulphate, using starch as indicator. 1 cc. of 0.1*N* iodine = 0.0045 Gm. of theobromine.—*J. Assoc. Official Agr. Chem.*, 19 (1936), 105. (G. S. W.)

Theobromine and Theophylline—Identification of. Tentative microscopic methods were adopted. Theobromine in 1:200 solution of hydrochloric acid (1–3) gives brown, radiating needles when treated with Kraut's Reagent (4 Gm. of bismuth nitrate in 20 cc. of nitric acid (1:1) added

to 13.6 Gm. of potassium iodide in 25 cc. of water, freshly prepared). Theophylline in 1:200 solution gives slowly forming dense spheres of radiating needles when treated with ammonical silver nitrate reagent (5 cc. of 2% silver nitrate with 5 cc. of 10% ammonium hydroxide).—*J. Assoc. Official Agr. Chem.*, 19 (1936), 102. (G. S. W.)

Titrimetric Colorimetry—Contribution to. Methods for colorimetric titrations are discussed in this review of the author's dissertation. The following determinations are covered: Iron determination with rhodium; rhodium determination with iron; bismuth determination with iodide; copper determination with ammonia; copper coloration with ferrocyanide; copper determination with diethyldithiocarbamate; lead determination with sulphide; copper determination with sulphide; chromium determination with diphenylcarbazide; chromium determination as dichromate; phenolphthalein determination with alkali; salicylic acid determination with iron; adrenaline determination with ammonium molybdate. The following pharmaceutical applications are also discussed: adrenaline determination in solution of adrenaline hydrochloride; hydrocyanic acid determination in cherry laurel water; manganese determination in powdered iron; manganese determination in reduced iron and copper determination in reduced iron or powdered iron.—P. KARSTEN. *Pharm. Weekblad*, 72 (1935), 1327. (E. H. W.)

Vitamin A—New Color Test for. Rosenthal and Erdélyi showed that when catechol was added in the antimony trichloride test for vitamin A, the original blue color soon changed to purplish red, a color not given by other carotenoids. This color has been examined spectrophotometrically; the absorption spectrum changes during the course of half an hour. It is now found that guaiacol is more satisfactory than catechol, giving a color that is stable for an hour or two. It shows a maximum at 545 mμ and a lower one at 478 mμ, like the freshly prepared solution using catechol.—E. ROSENTHAL and M. WELTNER. *Biochem. J.*, 29 (1935), 1036; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 721. (S. W. G.)

Vitamin A Potency—Comparison of Spectrometric Method and Antimony Trichloride Test for Estimation of. For the present the biological assay must be considered the primary test for potency and other tests secondary. A comparison of the results obtained by two such methods on oils that had been biologically assayed is made in this paper. The Carr and Price antimony chloride test is well known. The other test used depends on the absorption band at 3280 Å. in the ultraviolet. These tests are rapid and inexpensive but the limits of accuracy must be kept in mind. Eleven oils were tested by the antimony trichloride method and then were sent to laboratories having equipment for the spectrometric assay; nine to one, four to the other. Results are tabulated. One laboratory obtained higher values than in the biological assay, the other obtained values agreeing reasonably well with biological assay when the oils had high values but there was greater variation on oils of low potency. With one exception the antimony trichloride tests gave Vitamin A values in fair agreement with those obtained through biological assay.—W. S. JONES and W. G. CHRISTIANSEN. *J. Am. Pharm. Assoc.*, 25 (1935), 1072. (Z. M. C.)

Vitamin C—Chemical Estimation of. The observation of Guha and Ghosh, that trichloracetic acid reduced 2:6-dichlorophenolindophenol, is confirmed. Except with concentrated solutions of the acid, this reaction is slow, and would not interfere in the titration of ascorbic acid unless either the concentration of the latter were unduly low, or of the acid unduly high. Ten per cent of trichloracetic acid would not interfere at a concentration of 2 mg. of ascorbic acid per 100 cc. When ascorbic acid solutions are allowed to stand, their titer toward the indicator falls. After 3 hours 16% diminution in the titer was noted. Addition of a drop of acetic or trichloracetic acid prior to titration restores the value to normal, but in longer periods irreversible oxidation occurs, and acidification, while it increases the titer, does not restore it to normal. In the extraction of vitamin C from the vegetable karela, or cabbage, 20 to 25% of trichloracetic acid was the optimum strength. A single extraction did not remove the whole of the vitamin C. On standing, rapid loss of vitamin C occurred after shredding the vegetables. The karela showed the same value for vitamin C by titration by extraction cold, or after boiling, but cabbage after boiling gave three times the value by cold extraction.—B. AHMAD. *Biochem. J.*, 29 (1935), 275; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 561. (S. W. G.)

Vitamin C—Determination of. Three methods are described. (1) *Ferric Sulphocyanide Method.*—Acidify the solution to be tested with hydrochloric acid, add 3 or 4 drops of 4% ammonium sulphocyanide solution, mix, and add a few drops of very dilute ferric chloride solution. In

presence of vitamin C, the red ferric sulphocyanide color disappears in a few seconds (reduction from the ferric to the ferrous state). (2) *Cupric Sulphocyanide Method.*—If to a hydrochloric acid solution of vitamin C there is added a sufficient amount of copper sulphate, followed by ammonium sulphocyanide (added dropwise) there is first formed a white precipitate of cuprous sulphocyanide due to reduction by the ascorbic acid from the cupric to the cuprous state. When precipitation is complete, further addition of sulphocyanide produces a green color owing to the formation of cupric sulphocyanide. The color indicates the end of the reaction between the vitamin and the cupric salt. The reaction is used only as a qualitative test. (3) *Mercuric Chloride Method.*—On mixing non-alkaline solutions of the vitamin and of mercuric chloride, there is immediately formed a fine precipitate of calomel. The amount of ascorbic acid can be determined from the amount of calomel formed, or by determining the excess of mercuric chloride, or by titrating the acidity that is formed according to the equation $2HgCl_2 + H_2 = Hg_2Cl_2 = 2HCl$ bromothymol blue or phenol red being suitable indicators. The sensitiveness of the three reactions is such that a definitely positive test is obtained with 1 drop of a 0.5% ascorbic acid solution in 20 cc. of water.—E. PITTARELLI and M. PITTARELLI. *Biochim. Terapia Sper.*, 22 (1935), 100–106; through *Chimie & Industrie*, 35 (1936), 134. (A. P.-C.)

Wine Analysis—Methods of. To secure a truly accurate sample the entire tank should be thoroughly agitated. Alcohol is usually determined ebullioscopically, though hydrometers and pycnometers are used in its determination. Volatile acids are determined usually by steam-distilling a 10-cc. sample until 50 to 100 cc. of distillate are collected, titrated and calculated as acetic acid. Phenolphthalein is used as an inside indicator in titrating white wines for total acidity, and as an outside indicator for red wines. Reducing sugars are determined by measuring the amount of unused cupric ion after the wine has been boiled with a known amount of Fehling's solution. Sulphur dioxide is best determined by the bicarbonate-hydrochloric acid method. Tannin is usually considered of insufficient importance to warrant analysis; however, it may be titrated with permanganate using indigo-carmine as indicator. Iron and other metal ions are to be avoided in wines.—C. H. MCCHARLES and G. A. PITMAN. *Ind. Eng. Chem., Anal. Ed.*, 8 (1936), 55. (E. G. V.)

Wines—Complexes of Iron in. Experiments of electrophoresis on wines show that the iron goes to the anode together with the tartrate and citrate ions. Oxidation-reduction studies reveal a very low concentration of ferric ions. Thus ferric iron can only exist in wines in the form of complexes.—L. GENEVOIS. *Bull. soc. chim.* [5], 2 (1936), 1594. (E. G. V.)

PHARMACOGNOSY

VEGETABLE DRUGS

Fennel—Infestation of. A lot of fennel bought from a Swiss drug house was found after a few months to be infected with small black insects. The fruits were then closely examined and found to contain 1.8% by weight of stems, dirt, etc., and 10.4% of dill seeds (*Fruct. anethi graveolentis*). Only the fennel was infected with the insects, 11.1% by weight of the true fennel containing the larvæ of the insects. The larger of the insects was identified as *Systole albipennis*-Walker. The other and smaller insect was identified as *Tetrastichus rapa*-Walker, a parasite on *Systole albipennis*. The life history of the insects was not studied. The females apparently deposit the eggs in the endosperm of the fruit which serves as the food for the larvæ. It is hoped that the short discussion will place druggists on their guard for the insects.—H. KUTTER. *Schweiz. Apoth.-Ztg.*, 74 (1936), 125. (M. F. W. D.)

Sandalwoods and Scented Woods—Structure of. This is a continuation of some previous work on the structure of some scented woods from the East (*Kew Bull.* (1933), 3–15) and in the present communication the structure of the woods of 19 trees is described. These include East Indian Sandalwood, *Santalum album*, Australian Sandalwood, *Eucarya spicata* and *E. acuminata*, and Red Sanders Wood, *Pterocarpus santalinus*, all of which are of pharmaceutical interest. The remaining 15 woods are derived from the following plants: *Santalum austro-caledonicum, S. freycinetianum, S. Yasi, Exocarpus latifolius, Eremophila Michelli, Ximenia americana, Erythroxylum monogynum, Adenanthera pavonina, Amyris Balsamifera, Brachylæna Hutchinsii, B. sp., B. merana, Convolvulus scoparius, C. floridus* and *Urandra sp.* The macroscopical and microscopical characters are given for each wood, details of the dimensions of the anatomical elements

being given under the microscopical characters. The paper is illustrated by 16 excellent microphotographs of certain of the woods. The appearance of the aqueous and alcoholic extracts of the woods is also described and the details for seven woods, closely allied to sandalwood, are tabulated to facilitate comparison. The details for the four more pharmaceutically important of these woods are shown on page 221.

Animal Drugs

Desiccated Thyroid and Suprarenal—Microscopy of Powdered. It has become evident that biological assays alone will not entirely satisfy the purity or the identity standards of powdered desiccated endocrine glands. Unless there are microscopic descriptions available they will be prone to adulteration with organic cellular material. The author has made a study of these desiccated glands and their powders and outlines the results of these studies upon suprarenal and thyroid glands. Materials and methods are described in a general way and then specifically and plates show the histological elements found in each substance.—Heber W. Youngken. *J. Am. Pharm. Assoc.*, 25 (1936), 103. (Z. M. C.)

Endocrine Glands—Microscopical Characters of. A report of the results of further studies upon the microscopy of powdered desiccated endocrine glands obtained from cattle and hogs and, in the case of thyroid and pituitary from sheep also, with a view toward providing microscopical standards for these products. The following glands were studied: Thyroid, suprarenal, pituitary, ovary, corpus luteum.—Anon. *Pharm. J.*, 136 (1936), 44. (W. B. B.)

PHARMACY

Galenical

Adonis Vernalis—Method of Making Purified Extracts. The following methods give preparations containing the cardiac glycosides in a relatively pure condition. One part of the drug is treated with 15 parts of cold water, the liquid is pressed, filtered and shaken for two hours with 0.2–0.3 part of animal charcoal. The charcoal is separated, washed with a little water and dried in the air at ordinary temperature; it is then extracted in the cold with anhydrous chloroform, which takes some days, and the chloroform distilled off. The dark oily residue is treated with water and ether, the glycosides going into the water, which is washed twice with ether, and then adjusted to the required strength with more water. A solution containing 1,000 frog units per cc. is almost colorless and contains 2–3 mg. of dry residue per cc. To prepare a solid extract, one part of drug is extracted with 15 parts of alcohol (40%), the alcohol is distilled off and a solution of lead acetate is added to the aqueous liquid. The aqueous extract is then treated with 0.2 part of animal charcoal and the latter dried and extracted with chloroform. The chloroformic solution is concentrated and poured into petroleum ether from which the glycosides separate as a thick oily liquid. This liquid is dried and then contains 400,000–500,000 frog units per Gm. If this is taken up in water and the water evaporated *in vacuo*, a non-hygroscopic brown powder, readily soluble in water, containing 500,000–600,000 frog units per Gm., is obtained. An improvement is to add a little acetone (1% in the first method and 0.5% in the second) to the water. The author tested the preparation on pigeons, and considers that the production of emesis in these animals is a measure of the therapeutic cardiac action. He found that the lethal dose was 3.3 times the emetic dose, which shows a good margin of safety in use, especially as, unlike digitalis, the glycosides of adonis are not cumulative.—G. Toni and P. Farini. *Arch. Pharmacol. sper.*, 59 (1935), 186; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 737. (S. W. G.)

Alcohol Losses. Ways and means of preventing these losses, averaging 4–8%, in pharmaceutical manufacturing processes are discussed.—Francis Chilson. *Drug and Cosmetic Ind.*, 38 (1936), 183–186, 206. (H. M. B.)

Beetle—Drug Room. Inspection of stock-rooms, cellars, counters, packages, shelves and boxes should be carried out to detect the presence of pests such as the drug-room beetle (*Sitodrepa panicea*), which is indicated by much powder and broken bits among the drugs affected. The use of fumigants is recommended, and carbon tetrachloride or chloroform is suitable. About 25 cc. should be added for each 100 cubic feet of drug and the treatment preferably repeated a week or two later.—Anon. *Pharm. J.*, 136 (1936), 22. (W. B. B.)

Bismuth and Magnesia Precipitate. A mixture of *Mist. Bism.* N. F. and *Mist. Magnes. Hydrox.*, on standing a short time, develops a very unpleasant taste. The change appears to be

Species	Vessels per Sq. Mm.	Radial Vessel Diameters	Tangential Vessel Diameters	Rays per Mm.	No. of Cells in Ray Height	Height of Rays in μ	Width of Rays in μ	Height of Ray Cells in μ	Diameter of Metatracheal Parenchyma Cells
Santalum album	27–61	20–104μ mostly 48–90	20–76μ mostly 36–68	6–10	1–34 mostly 10–18	Mostly 160–360 maximum 580	8–36 mostly 16–30	12–48	12–28μ
Eucarya spicata	48–95	48–88μ mostly 60–80	40–68μ mostly 40–60	5–8	1–20 mostly 6–13	Mostly 100–230 maximum 280	16–36 mostly 16–28	8–64 mostly 12–24	12–28μ mostly 16–24
Eucarya acuminata (1 specimen)	22–31	72–100μ mostly 76–100	60–88μ mostly 64–80	5–8	1–14 mostly 5–10	Mostly 100–200 maximum 232	Mostly 20–28	12–44 mostly 16–24	12–24μ mostly about 16
Pterocarpus santalinus	2–9 mostly 3–5 vessels or groups of vessels	88–280μ mostly 100–220	84–200μ	6–11	Up to 9 mostly 6–7	108–136 sometimes more; highest observed 180	.....	20–30	20–30μ

Kew Bull., No. 4 (1935), 165; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 733.

(S. W. G.)

due to a very considerable increase in the alkalinity, and the taste seems to be very similar to that of sodium carbonate:

$$Mg(OH)_2 + 2NaHCO_3 \longrightarrow MgCO_3 + Na_2CO_3 + 2H_2O$$

It is probable, therefore, that the cause of the trouble is interaction of the magnesium hydroxide and the sodium bicarbonate, the formation of sodium carbonate being responsible for the bitter saline taste.—ANON. *Pharm. J.*, 136 (1936), 52. (W. B. B.)

Drug Extraction. VII. Effect of Method of Packing on Efficiency of Percolation. Degree of packing depends largely on quantity. In a 1,000- or 5,000-gallon percolator, weight of drug will usually produce enough packing. In packing a quart, the usual method is to apply pressure after all the drug is in, giving a greater degree of packing at top. Two methods of packing were tried under two different conditions. (*a*) Slow percolation with maceration before and after packing and (*b*) fast percolation with no maceration. Packing "from top" showed a larger volume than packing "in sections." Belladonna in No. 40 powder was used with a menstruum of alcohol, 5, and water, 1. The reserve portion was collected in two fractions. Results indicate that packing from the top is better than packing in sections, for more of the alkaloid was in the reserve. The method of packing had no appreciable effect on rate of extraction of total extractive. When there was no maceration, extraction was slower but there was no appreciable effect on the efficiency of extraction of total extractive.—WILLIAM J. HUSA and C. L. HUYCK. *J. Am. Pharm. Assoc.*, 25 (1936), 110. (Z. M. C.)

Homeopathetic Essences and Tinctures Containing Arbutin. Tinctures of 3 drugs from the Pirolaceæ and 8 from Ericaceæ were studied and the contents and pharmacological actions discussed. Qualitative tests for arbutin, hydroquinone, ericolin, gaultherin, rhododendrol, tannins, urson and ericodinin are described. The drugs and their tinctures are evaluated on the basis of their arbutin and hydroquinone contents by the method of Zechner (*Pharm. Monatsh.*, No. 9 (1929)).—A. KUHN and G. SCHÄFER. *Apoth.-Ztg.*, 50 (1935), 1800–1803. (H. M. B.)

Ointment Jars—Investigation of the Penetration of Light Through. The author determined the ability of 7 different makes of ointment jars to exclude light. The results are tabulated. The method employed consisted in inserting a strip of Kodak orthochromatic film of such a size and shape to completely cover the inner surface of the sides of the jar. The cap was then screwed on and in some cases sealed by means of a piece of black paper. The jars were then exposed to diffuse sunlight at a distance of 1 to 2 meters from a window for varying intervals of time. The films were then developed and the degree of darkening used as an indication of the penetration of light.—A. KAELIN. *Schweiz. Apoth.-Ztg.*, 74 (1936), 113. (M. F. W. D.)

Percolation—Development of. Historical Review of. The author takes up the subject under the following sub-titles: the early forerunners of percolators, the filter presses as developed in Germany, the work of the French pharmacists, the first official displacement processes, development of percolation procedures in America, France, England, Germany and Switzerland, the development of special procedures as repercolation, continuous percolation, pressure percolation, interrupted percolation, diakolation, mulkolation and evacolation. The article is accompanied by numerous diagrams and sketches of apparatus.—K. FEINSTEIN. *Pharm. Acta Helv.*, 11 (1936), 19. (M. F. W. D.)

Pharmaceutical and Phytochemical Preparations—Preparation of. Procedures for the preparation of (1) amyl nitrite, (2) sulphurous acid, (3) ethyl alcohol, (4) bismuth tannate, (5) chloroform and (6) bromoform are offered.—C. A. ROJAHN. *Apoth.-Ztg.*, 51 (1936), 296–298. (H. M. B.)

Pharmaceutical and Phytochemical Preparation—Procedures for the Preparation of. A continuation of a series of articles dealing with the preparation of (1) disodium hydrogen phosphate, (2) emulsin, (3) lithium salicylate, (4) precipitated sulphur, (5) myricyl alcohol (melissyl alcohol), (6) cerotic acid, (7) sulphur iodide, (8) lactylphenetidin (lactic acid-*p*-phenetidin), (9) manganese lactate, (10) antimony pentasulphide, (11) pectin, (12) racemic tartaric acid, (13) meso-tartaric acid, (14) zinc chloride and (15) zinc sulphate.—C. A. ROJAHN. *Apoth.-Ztg.*, 51 (1936), 104–107, 189–190. (H. M. B.)

Pharmaceutical and Phytochemical Preparation—Procedures for the Production of. A continuation of a series of procedures dealing with (1), (2), (3), (4) bismuth subcarbonate, subgallate, subnitrate, subsalicylate, (5) ethyl iodide, (6) barium chloride, (7) borosalicylic acid, (8)

ethyl *p*-aminobenzoate, (9) barium sulphate, (10) adipic acid, (11) acetyl chloride, (12) copper citrate, (13) copper ammonium sulphide, (14) creatinine chloride, (15) precipitated calcium carbonate, (16) cholesterin, (17) mercurous nitrate, (18) inulin, (19) chrysarobin, (20) heavy magnesium carbonate and (21) euphorbon.—C. A. ROJAHN. *Apoth.-Ztg.*, 50 (1935), 1714–1715, 1868–1871. (H. M. B.)

Product Matching. D. suggests 2 ways to match new products: (1) by careful analysis of the products; this is very time-consuming and (2) a quicker method is to fashion a suitable preparation with the same properties of that to be matched. In the case of *cold creams*, the type of emulsion, the percentage of water, oil, beeswax, paraffin and the kind and amount of emulsifying agent should be determined and then prepare a series of creams of varying formulas to match. To reproduce *face powders*, a qualitative and quantitative analysis should be made to determine the inorganic constituents, ash test and certain raw materials and colors may be determined with the aid of the microscope. In the case of *skin tonics* and *astringents*, the taste, physical application and drying times are of value in estimating the products. *Lipsticks* can only be duplicated by the preparation of many samples until one is chanced upon to give similar application, feel, texture, indelibility and melting point. *Hand lotions* should be examined as to type, sheen and the emulsifying agent present.—THORPE W. DEAKERS. *Drug and Cosmetic Ind.*, 38 (1936), 187–188, 192. (H. M. B.)

U. S. P. and N. F. Preparations—Shortened Procedures for Three. The official method for Compound Solution of Cresol is time-consuming and the prolonged heating yields a dark product which is quite alkaline. The literature revealed that several have suggested methods. The following formula is submitted: "Cresol, U. S. P. 500 cc., Sapo Mollis, U. S. P. 555 Gm., to make 1,000 cc. (*a*) By heating to 70° C. or (*b*) by shaking until solution is effected." A tabulation shows approximate time for preparation, color and specific gravity for four methods. The product by the suggested procedure seems to indicate a lower alkalinity. Difficulties in preparation of Compound Solution of Sodium Phosphate are due to the difficulty in obtaining sodium phosphate in uneffloresced condition. This makes the solution slightly supersaturated and there is precipitation in varying degrees. Moistening with water as directed by N. F. is tedious and unsatisfactory and the finished preparation filters very slowly. Studies made by the authors show that the method proposed by H. M. Faser is very satisfactory, yielding a solution that keeps well and which may be prepared with a saving of time and at two-thirds the price of the N. F. solution. Following is the formula: "Exsiccated Sodium Phosphate 396.5 Gm. (= 1,000 Gm. of crystalline salt), Citric Acid 130.0 Gm. Dissolve the chemicals in 800 cc. of water, heat to boiling and filter into a sterile container, add glycerin (150 cc.) and sufficient boiled water to make 1,000 cc." A table compares the four N. F. samples and six by the Faser method giving p_H, specific gravity and precipitation after six months. Many studies have been made of Aromatic Elixir and a number of these are discussed briefly. The idea of using terpeneless oils was developed. Two compound spirits were prepared: (*a*) "by substituting for the oils in the official spirit the like amount of terpeneless oils and (*b*) since these oils are much higher in desirable principles than the official oils, one-tenth of the amounts of oils as employed in (*a*) were used." These spirits were used in preparing Aromatic Elixir. Talc was omitted. One filtration through a hard filter gives a brilliantly clear preparation. A table shows a comparison of aromatic elixirs by seven different methods as to filtering medium, rating as to time consumed, specific gravity, p_H, sediment, color, odor, taste.—W. J. SMITH and HENRY M. BURLAGE. *J. Am. Pharm. Assoc.*, 25 (1936), 123. (Z. M. C.)

PHARMACOPŒIAS AND FORMULARIES

Swiss Pharmacopœia V—Maximum Doses of. The article consists of a table containing the maximum single and *per diem* doses of the more potent drugs of the Swiss Phar. V.—ANON. *Schweiz. Apoth.-Ztg.*, 74 (1936), 100. (M. F. W D.)

NON-OFFICIAL FORMULÆ

Cosmetic Cream. A cosmetically useful oil and a substance from the group consisting of prime stearine, stearic acid and spermacetti are combined in proportions to produce a product having cosmetic cream consistency within the usual range of atmospheric temperatures, the mixing being effected at a temperature below room temperature.—HOWARD A. KIERNAN. U. S. pat. 2,032,704, March 3, 1936. (A. P.-C.)

Cosmetic Specialties. The following unclassified preparations are tabulated:

Item	Purpose	Properties	Composition	Formulæ	Liquid	Salve	Stick
Deodorant	To deodorize perspiration with or without diminishing the flow	Liquid, cream or stick. Should not irritate the skin; easy to apply	Active ingredients astringent and antiseptic; vehicle is simple solution, salve, cream or solid stick	Alum	15.0	..	20.0
				Boric Acid	..	5.0	..
				Zinc Oxide	..	15.0	5.0
				Glycerin	5.0	..	..
				Petrolatum	..	78.0	50.0
				Paraffin	..	2.0	25.0
				Water	80.0	..	..
				Perfume and color if desired			
Depilatory	To remove superfluous hair	Powder to be made into a paste before use, or a cream	Alkaline earth sulphides in alkaline media; perfume to cover hydrogen sulphide	Strontium sulphide	50.0	27.0	30.0
				Calcium sulphide	..	2.4	20.0
				Starch	30.0	4.8	30.0
				Zinc oxide	19.8	24.0	..
				Menthol	0.2	1.0	1.0
				Talc	..	..	19.0
				Tragacanth	..	0.8	..
				Glycerin	..	8.0	..
				Lanolin	..	8.0	..
				Water	..	24.0	..
				Perfume			
Astringent cream	To tone and refine skin; to reduce large pores	Should be like other creams in color and consistency; not too irritating	Cream base containing astringents such as tannic acid, aluminum salts, alcohol, etc.	Absorption base	..	15.0	..
				Cetyl alcohol	7.5	..	6.0
				Petrolatum	..	33.0	29.0
				Lanolin	5.0	2.0	..
				Paraffin	7.5	..	5.0
				Mineral oil	30.0	15.0	30.0
				Alum	4.0	..	..
				Tannic acid	..	5.0	3.0
				Acetic acid (80%)	1.0	..	2.0
				Water	45.0	30.0	25.0
				Perfume			
Bleaching cream	To whiten skin	Medium soft tissue cream containing non-irritating bleaching creams	Use bleaching compound and cream ingredients that are stable	Zinc peroxide	10.0	..	..
				Sodium perborate	..	5.0	..
				Hydrogen peroxide (3%)	..	..	30.0
				Absorption base	..	20.0	..
				Cetyl alcohol	..	..	6.0
				Petrolatum	75.0	..	20.0
				Paraffin	5.0	2.0	5.0
				Mineral oil	5.0	33.0	34.0
				Lanolin	5.0	..	5.0
				Water	..	40.0	..
Hand cream	To soften, whiten and protect the hands	Medium soft cream; should not leave the hands greasy or sticky	Vanishing or tissue creams which are not too oily. Emulsifier for oil-in-water emulsion should resist acid	Absorption base	15.0	20.0	..
				Beeswax	3.0	..	5.0
				Cetyl alcohol	..	3.0	10.0
				Emulsifier	..	..	0.5
				Peanut oil	10.0	10.0	5.0
				Lactic acid	2.0	2.0	1.5
				Water	70.0	65.0	78.0
				Perfume			

ANON. *Drug and Cosmetic Ind.*, 38 (1936), 198-199. (H. M. B.)

Deodorants. Causes of body odor are discussed. These preparations are astringent or non-astringent and are in the form of powders, pastes and liquids. The following formulas are offered: (1) *Powders.*—(*a*) Boric acid 30, zinc peroxide 10, zinc stearate 15, talc 45. (*b*) Chloramine-T 2, boric acid 40, zinc stearate 15, talc 43. (*c*) Salicylic acid 2, boric acid 40, talc 48, zinc stearate 10. (2) *Pastes.*—(*a*) White petrolatum 72, titanium oxide 2, boric acid 25, salicylic acid 1. Soften the petrolatum, stir in the mixed powders and run through a mill. (*b*) Glyceryl monostearate 15, titanium oxide 1, petrolatum 3, beeswax 2, formaldehyde (40%) 1, water 78. All ingredients are heated until a smooth white cream is formed, mix until the mass cools to 45° C. and stir in the formaldehyde. (3) *Liquids.*—(*a*) Formaldehyde 2, Tr. benzoin 5, lavender water 93. (*b*) Aluminum aceto-tartrate 8, glycerin 5, cologne water 20, water 67. (*c*) Aluminum chloride 7, aluminum sulphate 9, boric acid 10, water 74. Heat the water, dissolve the boric acid, then the sulphate and finally the chloride. Cool, add kieselguhr and filter.—ANON. *Drug and Cosmetic Ind.*, 38 (1936), 193–194, 206. (H. M. B.)

Essential Oils in Soaps. The average content of essential oil in a piece of ordinary toilet soap is from 0.5 to 1%. This is stated to be too low, since the majority of users require a soap which not only cleanses the skin but also perfumes it. It is not only the very cheap soap, but also the well-packed tablet, sold at a medium price, which suffers from this defect. An emulsifying agent is recommended to be used for the faultless preparation of soap with up to 5% pine oil. The addition of a small quantity of one of the many sulphonated oils will enable 50%, in certain cases 100%, of its weight of essential oils to be emulsified. On the addition of water to such a solution of oil and emulsifier a chalky white emulsion is formed. If only 10 to 20% of oil is added to the emulsifier, addition of water gives a clear solution. If a low percentage soap will not take up large quantities of essential oil, a liquid emulsifier should be used. A liquid bath soap containing pine needle oil, which has practically the properties of pine needle balsam, or pine needle milk can be made from the following: Pine needle oil, 800 Gm.; pine oil, 100 Gm.; emulsifier, 500 Gm.; neutral potash soap (15%), 8,500 Gm.; potassium borate, 100 Gm.—ANON. *Pharm. J.*, 136 (1936), 69. (W. B. B.)

Face Powder—Loose and Compact. Bases, coloring agents and odors for face powders are discussed and the following formulas offered: (1) *A White Face Powder.*—Starch 300 Gm., zinc oxide 200, talc 400, magnesium carbonate 100 with 2% Mars-yellow yields a powder with a Rachel No. 1 tone for oil skin. (2) *A Well-Covering Powder.*—Titanium oxide 30 Gm., colloidal kaolin 200, Agfa powder base Z 50, starch 200, magnesium carbonate 50, talc 470. With 10 Gm. carmin, 7 Gm. alizarin lac No. 40, 2 Gm. ultramarine blue No. 11 or 8 Gm. Jacaranda brown yields a powder of a light rouge brunette. (3) *Powder for Smooth Skin.*—Starch 150 Gm., talc 230, titanium oxide 20, colloidal kaolin 350, powder base M 150, magnesium carbonate 50, zinc stearate 50. (4) *Compact Powder* (binder-free).—Talc 370 Gm., colloidal kaolin 250, starch 340, kaolin suspensiv 10, zinc oxide 50 (or titanium oxide 25 and powder base Z 25). (5) *Starch and Binder-Free Compact Powder.*—Talc 450 Gm., colloidal kaolin 300, kaolin suspensiv 20, magnesium carbonate 50, calcium carbonate 30, titanium oxide 50 and zinc stearate 100. (6) *Colloidal-Kaolin-Free Compact Powder.*—Talc 350 Gm., starch 350, fine *Bolus alba* 100, magnesium carbonate 100, calcium carbonate 50, colloidal aluminum hydroxide 20, titanium oxide 30 (or some mucilage of tragacanth).—JOSEF AUGUSTIN. *Riechstoff-Ind. Kosmetik*, 11 (1936), 4–7. (H. M. B.)

Hair Tonics—Preparations for the Hair. II. The various types of hair tonics and components are discussed. The following formulæ are offered: (1) *Clear Oily Hair Tonic.*—Odorless castor oil 18%, chloral hydrate 2%, alcohol 79.5%, perfume 0.5%. (2) *A Resorcinol Tonic.*—Resorcinol monacetate 3 Gm., spirit of formic acid 20 Gm., castor oil 7 Gm., alcohol 69.75 Gm., perfume 0.25%. (3) *Sulphur Tonic.*—Dilute 25 cc. sulphur-diasporal A-Klopfer with 25 cc. water, dilute further with a clear solution of 10 Gm. pure saponin in 539 cc. water; stir in solution of 1 cc. bay oil in 400 cc. 97% alcohol. (4) *Cholesterin Tonic.*—Isopropyl alcohol 66 Gm., glycerin 2.5, cholesterin 0.5, water 30 and perfume 1.—J. AUGUSTIN. *Riechstoff-Ind. Kosmetik*, 11 (1936), 23–26. (H. M. B.)

DISPENSING

Acetylsalicylic Acid Mixture N. F. It appears that in the decomposition of aspirin in solution in citrates and acetates at room temperatures, 33% is decomposed in about four days,

51% in a week and 90% in about three weeks. While there appears to be no evidence that the therapeutic activity of the resulting salicylates is markedly inferior to that of the original acid, it is obviously undesirable that a decomposed mixture should be dispensed, and stock mixtures should not be used. It is the usual experience that complete solution of the aspirin is difficult to attain, and considerable time is sometimes required for the final solution of the last traces of aspirin. These traces represent an extremely minute proportion of the whole, and it is believed to be a common practice to strain them out. It is certainly not due to the saturation of the potassium citrate solution since much more than the $7^1/_2$ grains of aspirin per dose can be dissolved in the potassium citrate. It is probably due to the difficulty of wetting the crystals owing to the presence of an air film.—ANON. *Pharm. J.*, 136 (1936), 81. (W. B. B.)

PHARMACEUTICAL HISTORY

Apothecaries in Landau—History of. A continuation of a series of historical articles.—HAGEN. *Apoth.-Ztg.*, 51 (1936), 225–226. (H. M. B.)

Apothecaries in the District of Königsberg in Neumark—History of. IV. History of the apothecaries of the City of Bärwald.—GEORG EDMUND DONN. *Apoth.-Ztg.*, 50 (1935), 1837–1841. (H. M. B.)

Court Apothecary in the Market in Eisenach—350 Year Old. Historical.—ANON. *Apoth.-Ztg.*, 51 (1936), 8–11. (H. M. B.)

Medical Practices of the New England Aborigines. Subheadings of this very comprehensive paper indicate somewhat its scope: The New England tribes, the health of the Aborigines, some superstitious practices, medical practice and pharmacy. There is considerable information about remedies but much less is available about the diseases for which they were used. The author quotes interesting statements from a number of writings and appends an excellent bibliography.—WILL T. BRADLEY. *J. Am. Pharm. Assoc.*, 25 (1936), 138. (Z. M. C.)

Scheele. Supplement II. A historical account dealing with Scheele's last sickness and death.—OTTO ZEKERT and BIRGER STRANDELL. *Pharm. Monatsh.*, 17 (1936), 1–4. (H. M. B.)

PHARMACEUTICAL EDUCATION

Basic Sciences in a School of Pharmacy—Presentation of. The author presents some reasons why organic chemistry and other basic sciences should not be presented with a "pharmacy-slant." Modification and application of basic science has done much harm to pharmacy. The method was a necessary evil in two- and three-year courses but it is neither necessary nor justifiable in the four-year curriculum. There have been attempts to modify textbooks and usually they have been abbreviated and simplified. The pharmacist of the future must be thoroughly trained in fundamentals. We should not expect students to apply a science until principles have been mastered. If credits are to be transferred it is necessary that educators in other fields give full recognition to courses in basic science. The proponent of the applied system accepts this but says points of interest to his profession may be pointed out in passing. The author believes such teaching is psychologically unsound because the "pharmacy student is above all interested in those things which apply to pharmacy, and if principles are continually referred to the thing in which he is most interested, it becomes for him a detached fact applicable to his interest, and not a principle which can be employed as such." Examples are given to show why official preparations should not be selected for a course in analytical chemistry and reasons are given for not discussing U. S. P. ether and chloroform in a basic course in organic chemistry. In order to cover both principles and application it would require at least a year of ten units per semester and even then the student might not have the proper perspective. It does not matter whether the basic sciences are presented in academic departments or in the colleges of pharmacy and should depend on facilities and general organization of the school. Much depends on the individual teacher but there is danger in encouraging application of basic sciences as a general educational policy.—T. C. DANIELS. *J. Am. Pharm. Assoc.*, 25 (1936), 131. (Z. M. C.)

Drug Store Sundries—a Course in the Study of. Schools of pharmacy are the best places to impart knowledge of merchandise as well as of medicinal products. What should be taught depends upon the district. The Syllabus prepared by Dr. Ballard meets the need of such a course. The technique of using a camera and choosing film material could be included. There is no question of the value of a photographic department in a drug store. It yields a good profit

and brings the customers in frequently. Another line of drug sundries is bristle goods. Notes on history, method of manufacture, care and preservation should be included. Manufacturers are glad to coöperate. A study of foot preparations and appliances might be included also. Such a course should be elective.—HAAKON BANG. *J. Am. Pharm. Assoc.*, 25 (1936), 129. (Z. M. C.)

Pharmacognosy Department at Egyptian University. The course in pharmacognosy which extends over three years is briefly reviewed.—RALPH BIENFANG. *J. Am. Pharm. Assoc.*, 25 (1936), 128. (Z. M. C.)

PHARMACEUTICAL LEGISLATION

State Fair Trade Acts. The author lists the states having fair trade acts and enumerates some of the things that these laws cover, discussing them briefly.—PAUL C. OLSEN. *J. Am. Pharm. Assoc.*, 25 (1936), 148. (Z. M. C.)

MISCELLANEOUS

Entangling Alliances. Disillusionment is the price of experience. Pharmacy presents many entangling alliances and our ability to avoid them or to balance them against each other is one measure of our ability to make a place for ourselves. A common experience of members of college staffs is some sort of consulting connection in pharmacy or related fields. These connections may be ethical or they may mean being an expert witness in defense of some much advertised and falsely acclaimed nostrum. Between extremes are border line problems between right and wrong. The more questionable the issue the larger the money temptation. Any dean or teacher who is associated even once with a recognized fraud or uses his influence for personal gain loses much of the finer ethical sense and power for the right that all desire. Teachers are asked to use their names in advertising schemes. The invitation comes as an innocuous suggestion but one's endorsement of a pure chemical turns out to be an ad for somebody's product. The question of how many students the schools should train may bring out honest difference of opinion. Economic status of the school is involved. Until schools derive a fair share of income from endowment or state aid, extreme points of view cannot be reconciled. The use of proprietary remedies instead of real prescriptions is a difficult question and can only be solved by coöperation of educators, retailers and physicians. The alliances involving the business affairs and the revisions of the U. S. P. make an interesting chapter in the history of American pharmacy. Entangling alliances at their worst and at their best are to be seen at U. S. P. conventions. A recent alliance is the attitude of organized groups toward new food and drug legislation. The list could be continued. Each is entitled to answer in his own way. If the situation ever grows better school-men must assume the responsibility for making it so. Schools must work toward a reduced number of pharmacists. With this there will come a reduced number of pharmacies and no permanent change can come without that. Students must be trained to be public health conscious. The American Association of Colleges of Pharmacy must make this a primary concern. The AMERICAN PHARMACEUTICAL ASSOCIATION must rededicate itself. The National Association should preach the gospel that "A well-informed pharmacist is the best single individual to disseminate information about public health." Educators must not be drawn into entangling alliances.—W. F. RUDD. *J. Am. Pharm. Assoc.*, 25 (1936), 134. (Z. M. C.)

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Alcohol—Study of the Fixation of, on the Brain of the Rat Rendered Experimentally Alkalosic. Normal rats and those rendered alkalosic with sodium carbonate were anesthetized with alcohol given intravenously and the animals were sacrificed in from 1 to 30 minutes and the alcohol determined in the brain and blood. The minimum anæsthetic dose in the normal rat was 2.16 mg. per Gm., and 2.72 mg. per Gm. in the alkalized rat or one accustomed to alcohol. The hyposensibility to alcohol shown by the rat in which alkalosis has been induced experimentally by sodium carbonate is due to an earlier elimination of the alcohol as a result of pulmonary hyperventilation.—JEANNE LEVY. *Compt. rend.*, 202 (1936), 440. (G. W. H.)

Androsterone—Assay of. Androsterone, synthesized from epidihydrocholesterol by Ruzicka has been assayed, using 74 castrated male rats and doses (by injection in 0.2 cc. of oil

solution) ranging from 200–1800γ (micrograms) per day. Over the range of 200–900γ per day the percentage increase in the weight of prostate (or of prostate plus seminal vesicles) is a linear function of the dose. As an international unit of androsterone, the amount which gives the smallest definite physiological effect is suggested; a 40% weight increase in the organs is caused by 170γ of androsterone. This value or 150 or 200γ found by other workers for the capon unit is suggested as 1 international unit. The probable error of the present experiments on all 11 litters is computed statistically as ±5%. The penis and preputial glands also increased in weight approximately proportionately to the dose of androsterone but the effects were less regular than with the prostate.—V. KORENCHEVSKY and M. DENNISON. *Biochem. J.*, 29 (1935), 1920; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 716. (S. W. G.)

Cascara Sagrada Extract—Constituents in. 2. Method of Bioassay. Methyl anthraquinones predominate in Cascara sagrada and the extracts have been classified as anthracene, anthraquinone or emodin cathartics. Jowett has identified emodin and isoemodin (trihydroxymethyl anthraquinones) as free aglycones, rhamnol, a sterol, syringic acid, pyrocatechuic acid and several fatty acids. Beal and others have shown that the anthraquinones may be free or combined. Isolation of a rhamnoside yielding emodin and rhamnose upon hydrolysis has been reported but no definite quantitative correlation between any chemical unit and cathartic activity has been established. No method for assaying cathartics physiologically has come into general use. The present study was undertaken to establish a method sufficiently accurate to obtain further information about the various fractions. Chemical fractionation included extraction with ethyl acetate, yielding a highly colored resinous mass insoluble in water or alcohol. This was designated as Fraction A. The marc was divided into two portions, B. and C. Portion B. was extracted with alcohol yielding Fraction B. and then with acetone yielding B_2 with Portion C., order of extraction was reversed, acetone giving C_1 and alcohol C_2. B. and C. extractives were further divided according to lead acetate precipitations and solubility in organic solvents. Guinea pigs and white rats were used, the response of rats being less uniform. Details of the tests are reported and curves show results. The assay is not sharply quantitative but is sufficiently accurate with guinea pigs to interpret results of feeding various fractions or pure compounds. It appears that no one fraction is responsible for the full activity characteristic of the whole bark extracts. The total activity is probably due to synergistic effect of the various constituents. The water-insoluble fraction caused urine to have the high color characteristic of the anthraquinones. Since activity is probably dependent on several substances, specific chemical tests and irritability tests on isolated muscle are likely to be misleading in terms of cathartic value.—MELVIN W. GREEN, C. G. KING and GEORGE D. BEAL. *J. Am. Pharm. Assoc.*, 25 (1936), 107. (Z. M. C.)

Cod Liver Oil—Effects of Various Constituents of, on Certain Organic Structures. A study of the toxic effects on the organism (mice) of various constituents isolated from cod liver oil and administered in doses corresponding to the daily ingestion of 5 cc. of oil per kilo body-weight. For certain constituents (vitamins A and D, choline, isoamylamine) commercial products were used; iodine was administered as iodized oil; arsenic (which is frequently present in sea-fish oils in an unknown form) was given as arsenious oxide; the saturated and unsaturated fatty acids, higher alcohols, squalene and other unsaponifiable constituents were isolated from cod liver oil. The various products were incorporated with vegetable oils and administered orally. The fatty acids were decidedly toxic, generally causing death; they produced marked lesions of the heart and kidneys. No cases of death occurred after ingestion of unsaponifiables. Cholesterol, whether irradiated or not, is fairly toxic, producing death in 35 to 50% of cases. Vitamins A and D are not toxic, nor is squalene. Nitrogenous bases and iodine are liable to produce certain lesions which have been observed when using cod liver oil.—E. AGDUHR, G. BLIN and B. VAHLQUIST. *Upsala Läkareför. Förhandl.*, 40 (1935), 183–387; through *Chimie & Industrie*, 35 (1936), 133. (A. P.-C.)

Curarine and Prostigmin—Antagonism between. The peripheral actions of prostigmin and curarine have been studied repeatedly, showing that either is capable of producing acute depressant effects, which, however, are not identical. Their mutual antagonism is such that normal muscular action can be preserved when poisonous doses of the drugs are exhibited together. These results can be explained on the theory of chemical transmissions of excitation. Their application to the myasthenia problem is discussed.—G. BRISCOE. *Lancet*, 230 (1936), 469. (W. H. H.)

Dehydrascorbic Acid—Soluble Organo-Metallic Complexes of. New Studies on. Augmentation of Their Effects on Cancers by Variation of the Metals. The complex dehydrascorbates of cupri-sodium, cupri-plumbo-sodium and cupri-bario-sodium although weaker gave actions on cancers analogous to the corresponding iron compounds (*Compt. rend.*, 201 (1935), 745). It has further been found that with the iron compounds if after about ten daily injections the action is exhausted, another complex is used containing the same fundamental metal; the action is renewed and prolonged. The action ceases if the original complex is again used as if a tolerance or sort of chemical vaccination is produced. This is not the case if complexes with a different fundamental metal are alternately used.—FERNAND ARLOING, ALBERT MOREL and ANDRE JOSSERAND. *Compt. rend.*, 202 (1936), 598. (G. W. H.)

Digitalis—Importance of the Kidneys in the Standardization. The official publication of the League of Nations for standardization of digitalis directs that pregnant cats and those having pneumonia should not be used. Some individual cats are resistant to the toxic action of digitalis. Differences of 50% have been observed, as compared with the average minimum lethal dose. A table shows the effects of pregnancy and pathological changes in organs on the toxicity of digitalis, for the cat. Variation in dose is slight in healthy animals. Resistance to digitalis was determined under the following conditions: (*a*) In those in which experimental uranium nephritis had been induced; (*b*) after nephrectomy; (*c*) after tying the renal arteries; (*d*) after tying both ureters. Tabulated results show that the condition of the kidneys is an important factor in the determination of the action of digitalis on the heart and that the fact must not be overlooked in biological standardization of preparations of digitalis. The immediate cause of increased resistance to digitalis in the presence of inflammation of the kidneys cannot be determined from the experiments described. Resistance of cats to lethal doses of digitalis is increased by experimentally induced nephritis. Greater resistance to digitalis occurs in cases of inflammation of the kidneys which occurs naturally. It is often observed in cats. Only cats that are free from pathological changes in the kidneys should be used in the Hatcher-Magnus method of standardizing digitalis.—B. BOUCEK. *J. Am. Pharm. Assoc.*, 25 (1936), 97. (Z. M. C.)

Enteric Coatings—Errors in Reported Studies of. Due to faulty testing, erroneous results have been reported. Believing the X-ray to be the only satisfactory approach to the subject the authors have used it exclusively. They believe time necessary for disintegration cannot be accurately determined by use of solutions simulating gastric and intestinal fluids for the physiological factor is involved. Subjects used in an X-ray study do not react the same to the same type of tablet on different days. The only statement that can safely be made is that concerning disintegration. Lozinski and Diver used a tablet of barium sulphate and one of sodium salicylate, locating the point of disintegration of the barium sulphate tablet with a fluoroscope and deciding the disintegrating of the sodium salicylate tablet upon the presence of salicylate in the urine. If fluoroscopy is to be used, the use of only barium sulphate tablets should be better. The senior author and a co-worker have found that where several tablets were taken they seldom left the stomach at the same time and they have evidence that the emptying time is nearer six hours than an hour and a half. Wruble's method used a tablet of methylene blue and calcium sulphide. It appeared that the amount of sulphide used might produce insufficient hydrogen sulphide to produce eructation. This was tested on 41 subjects and only 9 (22%) had eructation. Husa and Magid used a tablet similar to Wruble's with orange shellac in the coating. In a study made by the author 24 tablets commercially coated with shellac disintegrated in the stomach in less than 3 hours. With a salol-shellac coating, the percentage of efficiency varied from 44 to 66. Johnson and Clark also tried Wruble's method, concluding that their salol coating was effective but doubting the effectiveness of the tablets. Dr. Clark supplied the author with 47 barium sulphate tablets. These were tested and, calculated on the basis of tablets disintegrating, it was found that 94% disintegrated in the stomach. Some tablets were given a fourth salol coating. The question of amount of salol was considered also. The tablets used were 1.13 cm. in diameter and the coating on two would be equivalent to the official dose of salol so the therapeutic action of salol would be given as well as the tablet itself. Forty-three of these tablets were administered and on the basis of the total number of tablets disintegrating, 91.6% disintegrated in the stomach. The authors reached the following conclusions: "1. The efficiency of salol as an enteric coating is low, even in mixtures with resins, because of its tendency to crystallize when applied to a tablet. 2. The most effective way to study enteric coatings is by use of the X-ray, which is most ad-

vantageously employed in the form of radiography because a permanent record is produced. Fluoroscopy is satisfactory but it has several technical disadvantages, such as the greater number of milliampere-seconds necessary for each exposure, consequently the individual subject cannot be used as frequently as in radiography, due to over exposure to the X-ray. 3. Because of the relatively small amount of hydrogen sulphide liberated and its ready solubility in the fluids of the stomach, the calcium sulphide-methylene blue method of investigation leads to erroneous interpretations of results.—F. S. BUKEY and C. W. BLIVEN. *J. Am. Pharm. Assoc.*, 25 (1936), 119. (Z. M. C.)

Erythrina Americana—Curare Actions of. Claims that *Erythrina Americana* possesses a typical curare action were confirmed and extended for several species of animals. The drug may be useful as an easily available and practical substitute for curare and a possible anticonvulsant in poisoning and excitatory states.—A. J. LEHMAN. *Proc. Soc. Exptl. Biol. Med.*, 33 (1936), 501. (A. E. M.)

Hydrated Magnesium Trisilicate. Hydrated magnesium trisilicate, as prepared for the included experiments, is completely innocuous when taken by mouth even in relatively enormous doses, and does not disturb the normal action of the bowel. In the stomach it exerts a prolonged neutralizing action, which continues for several hours. Its general adsorbent action is similarly continuous. Hydrated silica is produced by its interaction with the gastric juice and is itself a powerful adsorbent for many substances, including shell-fish poison and pepsin. The pepsin so absorbed is still available for the purpose of digestion. In the small intestine the contents are subjected to the combined adsorptive action of hydrated silica and a proportion of unsplit magnesium trisilicate. The adsorptive affinities of the latter cannot be exhausted quickly, and should therefore be available throughout the whole of the intestinal tract. In the fæces a rise in the percentage of silica occurs.—N. MUTCH. *Brit. Med. J.*, 3917 (1936), 205. (W. H. H.)

Insulin—Blood Pressure Responses to. Blood pressure remains unchanged during the hypoglucemic stage after insulin administration, but an increase is observed when the sugar level begins to return to normal. No increase of pressure occurs in patients with Addison's disease. It is concluded that the increase of blood sugar is initiated by secretion of adrenaline.—MICHEL PIOJOAN. *Proc. Soc. Exptl. Biol. Med.*, 34 (1936), 37. (A. E. M.)

Inulin—Suitability of, for Intravenous Administration in Man. Pure chicory and dahlia inulin can be injected in doses of 40 and even 80 Gm. without reactions. If the substance has been overheated during the drying process lumbar pain, nausea and other symptoms are observed.—WILLIAM GOLDRING and HOMER W. SMITH. *Proc. Soc. Exptl. Biol. Med.*, 34 (1936), 67. (A. E. M.)

Liver Extract—Effect on Pernicious Anemia of Massive Doses of Parenteral. The active principle from liver is stored in the patient when given in massive doses and will enable him to maintain a normal blood level for a relatively long period of time.—FRANKLIN R. MILLER. *Proc. Soc. Exptl. Biol. Med.*, 33 (1936), 580. (A. E. M.)

Liver Extract—Use of, Intramuscularly in the Course of Acute Amebiasis in Dogs. While liver or oral liver extract have a favorable influence on the course of the disease itself, parenteral liver extract failed to show such action, though the blood picture showed some improvement as a result of the treatment.—ERNEST C. FAUST and JOHN C. SWARTZWELDER. *Proc. Soc. Exptl. Biol. Med.*, 33 (1936), 514. (A. E. M.)

Pharmacology for Pharmacists. The fifth of a series of articles dealing with (*a*) analeptics (excitants of the central nervous system and circulation) including alcohol, camphor, atropine, lobeline and strychnine and (*b*) aphrodisiacs including yohimbine. The sixth of the series discusses the agents stimulating and paralyzing the peripheral nerves as (1) the antitetanics (remedies for tetanus), (2 local anesthetics such as cocaine, psicaine, tropococaine, novocaine and anæsthesin and (3) narcotics causing pain as veratrine.—H. FÜHNER. *Apoth.-Ztg.*, 51 (1936), 86–87, 173–175. (H. M. B.)

Pharmacology for Pharmacists. (See *Apoth.-Ztg.*, Nos. 86, 90 and 94 (1935).) The following anodynes or pain-relieving agents are discussed: (1) poppy capsules, (2) opium, (3) morphine, (4) codeine and dionin and (5) papaverine.—H. FÜHNER. *Apoth.-Ztg.*, 86 (1935), 1745–1746. (H. M. B.)

Pharmacology for Pharmacists. The seventh of a series of articles deals with the drugs affecting the vegetative nervous system including (1) ophthalmics such as atropine and physo-

stigmine, (2) agents which increase and retard salivary secretions (sialagogues, salivantia and antisialica) and (3) agents which increase and decrease perspiration (diaphoretics, hydrotics and anhydrotics) especially agaricin, camphoric acid and salvia leaves.—H. FÜHNER. *Apoth.-Ztg.*, 51 (1936), 262–264. (H. M. B.)

Phenobarbital—Comparative Minimal Hypnotic Effects, Toxicity and Pathology Produced by Sodium and Magnesium Salts of. Sodium and magnesium salts of phenobarbital show no difference when administered orally to rats or dogs. The magnesium salt shows a higher hypnotic effect when given intravenously.—WALTER F. TAYLOR and ROBERT W. LACKEY. *Proc. Soc. Exptl. Biol. Med.*, 33 (1936), 621. (A. E. M.)

Procaine Base, Para-aminobenzoyldiethylamino-ethanol—Influence of the Acid Combined to the Base on the Anæsthetic Power of Different Salts of. It has been shown (*Compt. rend.*, 200 (1935), 1428) that the anæsthetic action of cocaine is markedly influenced by the nature of the acid used to dissolve it. Similar results were obtained in this study using procaine base. 0.866 Gm. of base was dissolved in 100 cc. of distilled water with sufficient acid to give a p_H of about 5.4, the solutions thus corresponding in strength and p_H to the hydrochloride. The anæsthetic power was determined on the rabbit's cornea before and after sterilization. Nearly 50 organic acids were studied. While *o*-phthalic, hippuric and nicotinic nullified the action, the other acids increased it. Phenylbutyric, undecolic and phenylbutyl-acetic salts had, respectively, 50, 55 and 63 times the activity of the hydrochloride. The following generalizations are made: The anæsthetic power increases with the number of C-atoms of the acid used, it diminishes with all supplementary functions (COOH, OH, NH_2, Br, CH_3-CO), which have an unfavorable action increasing the nearer they are to the first acid group. From all the salts tested, the phenylpropionate and isobutyrate were chosen because of their good anæsthetic activity, preservation of this activity upon sterilization and aging, feeble toxicity, lack of irritation and good solubility in water. The phenylpropionate was used clinically on the mucous membranes of the nose, throat and rectum and gave results comparable to those of cocaine hydrochloride of the same strength without producing subtoxic phenomena. The isobutyrate was chosen for opthalologic applications because of the absence of irritating action. It also compared favorably with cocaine without causing dilatation.—JEAN REGENIER, RAYMOND DELANGE and ROBERT DAVID. *Compt. rend.*, 202 (1936), 591. (G. W. H.)

Salamander Triturus Torosus (Rathke)—Toxicological Study of the Cutaneous Secretions of. Report is made of a study of the toxic properties of an aqueous solution of the granular gland secretions of the western newt, a common salamander in the Oregon country. Cutaneous excretion is profuse during the breeding season. Hypodermic injections caused rapidly developing toxic symptoms in a number of animals—general depression, muscular incoördination and death by respiratory failure. Details of experiments and their results are reported. Local, circulatory and respiratory effects were observed. There was decreased rate and amplitude of heart contractions but predominating effect was on respiration.—ERNST T. STUHR. *J. Am. Pharm. Assoc.*, 25 (1936), 117. (Z. M. C.)

Testicular Hormone—Action of, on the Development of the Hen's Comb. Many tests have been proposed for the identification of male hormone and reference is made to a number of these. The present paper deals with the test of McGee and coworkers. Development of this test is discussed. The conclusion has been reached that the hen's crest is physiologically disconnected from the hormonal influence of the ovary. Feather changes show that there is no parallelism between the calonic action of the testicular hormone and the one exerted by estrin. If the interpretation is correct, the ovary would not interfere with the action of the testicular hormone in its influence on the crest's growth. Experimental work was undertaken to confirm this conclusion. Activity of testicular extract had been tested by means of prostatic and vesicular action in the castrated male rat. Adult hens, which have no spontaneous growth of the comb, were used. A comparison of the combs was made before and after brush applications of the hormone. A detailed description of method is given. It was found that the normal adult hen's comb develops intensely with the action of testicular hormone. The hen can be used instead of the Leghorn capon. Quantitative appreciation of the effect is afforded by the planimetric measurement of the comb's silhouette obtained by direct application of photographic paper.—E. RAMIREZ and M. D. RIVERO. *J. Am. Pharm. Assoc.*, 25 (1936), 99. (Z. M. C.)

Tolysin—Antipyretic Action in Rats of, Alone and in Combination with Phenacetin. Toly-

sin in doses of 250 mg./Kg. exhibits in fevered rats a marked antipyretic action lasting for more than 8 hours, but of slow onset. When this dose is combined with 100 mg./Kg. phenacetin a rapid onset and long duration is obtained. The presence of tolysin does not increase the toxicity of phenacetin.—ALFRED GILMAN and HENRY G. BARBOUR. *Proc. Soc. Exptl. Biol. Med.*, 33 (1936), 627. (A. E. M.)

Zinc and Vitamins—Combined Action of, in the Feeding of Animals. Mice from the same litters were fed on synthetic diets containing (1) zinc in amounts less than 0.05 mg. per 100 Gm. and (2) 2 mg. per 100 Gm. Vitamins A, B_1, B_2 and D were administered in concentrated form in olive oil. The animals in the second group survived for 57 to 74 days, while those in the first group died in 14 to 23 days, demonstrating the importance of zinc in the diet and its apparent synergistic action with some of the vitamins.—GABRIEL BERTRAND and R. C. BHATTACHERJEE. *Bull. Soc. Sci. Hyg. Aliment.*, 23 (1935), 369-376. (A. P.-C.)

TOXICOLOGY

Belladonna Poisoning from Liquid Extract of Liver. Several cases of poisoning have been reported from the use of liquid extract of liver. At first it was thought that the alkaloids were present in the bottle when it was filled with the liver extract, but this was shown to be a false impression inasmuch as it appeared in other containers. It was therefore investigated and proved, both pharmacologically and chemically, to be in the liver itself. Certain animals have immunity to such alkaloids and can freely eat the leaves of such plants.—N. F. WINDER and C. H. MANLEY. *Brit. Med. J.*, 3921 (1936), 413. (W. H. H.)

Carbolic Acid Poisoning—Treatment of. Many of the antidotes formerly recommended, milk, egg albumin, alcohol, glycerin and others, are ineffective. The authors have not been able to confirm the value of liquid paraffin as a solvent to prevent absorption of the poison. They recommend olive oil, administered promptly, in large quantities, preferably by getting the patient to drink it. Stomach lavage with liberal quantities is also performed, and the usual general and supportive measures are employed.—L. GOODMAN and A. J. GEIGER. *Amer. J. Med. Sci.*, 190 (1935), 206; through *Practitioner*, 135 (1935), 603; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 749. (S. W. G.)

Carbon Monoxide Poisoning—Mechanism of Methylene Blue in. Methylene blue changes carbon monoxide-hemoglobin into oxyhemoglobin and not into methemoglobin. The detoxifying action is very rapid.—MATILDA MOLDENHAUER BROOKS. *Proc. Soc. Exptl. Biol. Med.*, 34 (1936), 48. (A. E. M.)

Fluorine Poisoning, Acute. Five cases of acute fluoride poisoning are reported which corroborate the chemical and pathologic findings of previous reports. Terminal cutaneous petechial hemorrhages are observed and their presence attributed to the anticoagulant action of fluorine. The mechanism of fluoride toxicity is probably due to a combination formation of an insoluble calcium salt, and by the interference of the action of enzymes and lactic acid metabolism. Three grams are a sufficient quantity to cause death in man. Gastric lavage and subsequent stomach washing with lime water, milk or other calcium salts are at present the most proper treatment.—J. L. CARR. *Calif. and West. Med.*, 44 (1936), 83. (W. H. H.)

Phenobarbital—Jaundice Due to. Toxic symptoms appeared after 1 grain of phenobarbital had been given daily for 22 days. The skin condition was typical of phenobarbital poisoning, and since jaundice occurred concurrently, in the absence of any other cause, the conclusion was that the jaundice was produced by phenobarbital.—C. A. BIRCH. *Lancet*, 230 (1936), 478. (W. H. H.)

Potassium Permanganate Poisoning. Potassium permanganate, although one of the safest internal and external disinfectants in correct dilution, has toxic properties when used in concentration, and may even cause death, as has been shown by a review of the available literature. The fatal dose is not known, but it is seen from the reported case that 20 Gm. have proved fatal when injected through the uretheral canal. Vaginal injection of a concentrated solution has also caused abortion. Consideration of its many uses emphasizes the necessity for the application in the correct dilution for the particular purpose; otherwise it may act as a severe irritant poison.—S. G. WILLIMOT and M. FREIMAN. *Brit. Med. J.*, 3914 (1936), 58. (W. H. H.)

Sodium Fluoride Poisoning Due to Ingestion. Fluoride poisoning, as a result of the ingestion of quantities smaller than those heretofore considered toxic to humans, is a very real hazard

to public health, even as a cause of death, in addition to the effects of the mottling of teeth, as reported from Arizona and other points and gastro-intestinal irritation.—J. C. GEIGER. *Calif. and West. Med.*, 44 (1936), 81. (W. H. H.)

THERAPEUTICS

Anthelmintic. An anthelmintic composition containing a nicotine aluminopentasilicate.—CHARLES C. TAYLOR and ARTHUR L. GALLOWAY, assignors to TOBACCO BY-PRODUCTS AND CHEMICAL CORP. U. S. pat. 2,033,495, March 10, 1936. (A. P.-C.)

Antiscorbutic Activity and Chemical Structure. Besides *l*-ascorbic acid itself, other chemically related substances show some antiscorbutic activity; *d*-arabo-ascorbic acid has $^1/_{20}$, *l*-rhamno-ascorbic acid $^1/_5$, and *l*-gluco-ascorbic acid $^1/_{40}$ the activity of ascorbic acid. In the case of the last compound, tests by the author indicate a slightly lower activity. It is now found that when these compounds, and related inactive ones, are injected into guinea pigs that have received a scorbutic diet, only the active ones are retained to a significant extent by the organs, such as the liver and adrenals, which are normally richest in ascorbic acid. Moreover, the degree of retention is roughly proportional to the activity of the compounds, and the amounts excreted are inversely proportional to the activities.—S. S. ZILVA. *Biochem. J.*, 29 (1935), 1612; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 716. (S. W. G.)

Arsenicals Given by Enema in the Treatment of Amebic Colitis. Enemas with solutions of 0.15 to 0.9 Gm. Rhodarsan were given at 2- to 4-day intervals, increasing the dose each time. After 8–10 treatments, sodium sulphate was given as a cathartic followed by enemas with normal horse serum. The results were excellent.—CÁNDIDO P. MAYER and CARLOS A. MARCHESE. *Semana méd. (Buenos Aires)*, 43 (1936), 140. (A. E. M.)

"Bayer 205"—Prophylactic Action of, against Trypanosomes. A dose of 2 Gm. of "Bayer 205" administered to an adult may be expected to confer protection against *T. gambiense* and *T. rhodesiense* for at least three months. The protection may last much longer. One volunteer resisted infection by tsetse for 327 days after he had received 1.0 Gm. of "Bayer 205." In a proportion of those protected by "Bayer 205" and exposed to infection with human trypanosomes, infection when it does at length occur may be of a cryptic type, the patient showing no apparent symptoms for two months and possibly longer. An infection of this kind may gradually generate typical symptoms or it may become merged into a subsequent infection superimposed upon it and running a normal course. Cryptic infection can, however, arise independently in nature, apart altogether from the administration of any drug. A consideration of the behavior of the volunteer suggests that frequently repeated inoculations of living trypanosomes during the three or four months immediately following the administration of "Bayer 205" lead to the establishment of a more prolonged immunity than that conferred by the drug alone without such frequent exposures to infection. If this is true then the more intense the exposure in nature to infective tsetse the greater the benefit derived from the prophylactic.—H. L. DUKE. *Lancet*, 230 (1936), 463. (W. H. H.)

Copper Sulphate—Use of, in Staphlococcal Infections. The author advocates copper sulphate in the treatment of staphlococcal cutaneous infections. Intravenous injections of one ampul containing 10 cc. of a 1 in 200 aqueous solution of the salt are given daily until satisfactory improvement occurs, and thereafter every two days. In children 8 to 10 years old the dose should not exceed 5 cc. When daily injections are discontinued two pills, each containing 2 cg. of the medicament, are given three times daily half hour before food; they are continued for a week after all trace of the infection has disappeared. Local treatment should also be employed; this consists of daily irrigations with a lotion containing the salt, such as eau d'Alibour diluted ten times in warm water, and followed by applications of an ointment composed of one part of copper sulphate, two of camphor and ninety-seven of simple ointment.—J. HANNECART. *Bruxelles-Medical* (Nov. 24, 1935), 121; through *Brit. Med. J.*, 3917 (1936), 244B. (W. H. H.)

Cough—Drugs Used in the Treatment of. A discussion of the following classes of cough remedies: (1) disinfectants including guaiacol, creosote, creosote carbonate, guaiacol carbonate, potassium guaiacolsulphonate and calcium cresolsulphonate, (2) pain-relieving drugs such as morphine and its derivatives, belladonna leaves and abasin, (3) expectorants including emetics, saponin drugs, inorganic drugs, volatile oils, mucilaginous drugs, acids, ephedrine and protein bodies.—ERICH HERMANN. *Apoth.-Ztg.*, 51 (1936), 4–8. (H. M. B.)

Digitalis—Preoperative Use of. A discussion of post-operative disturbances with particular attention to circulatory disturbances, and the preoperative value of digitalis (I). A. recommends preoperative treatment with I even in cases with no detectable cardiac disturbance, to protect against post-operative disturbance. I was not harmful when given in cases where it was not needed. The recommended prophylactic procedure consists in giving 3 tablets of euphydigital, each containing 150 frog doses of I and 0.1 theophylline-ethylene diamine compound (II. euphylline) 3–4 days before the operation. Beginning with the day of operation, this dose is given rectally as long as oral dosage is impractical. From the 5th post-operative day, the dose is gradually decreased and dosing discontinued the 10–14th day; with evidence of decreased reserve power before the operation, medication is given over a longer period. There were no ill effects. In only a few cases medication was not tolerated orally; in these rectal administration was tolerated. In a series of 579 laparotomies, prostatic hernias and rectal operations prophylactically treated with I, there were 1.55% embolic thrombosis and 2.24% pneumonia. In 527 controls, 78 of which were treated with hydroxy-α-(methylaminomethyl)-benzyl alcohol (sympatol, III), the incidence was 7.02 and 10.24%, respectively, while for the 78 treated with III it was 11.50 and 17.90%, respectively. The addition of II to I increases coronary circulation and diuresis; II has a central stimulating action which favorably affects respiration and circulation.—TH. ALTENKAMP. *Münch. med. Wochschr.*, 82 (1935), 1709, No. 45; through *Squibb Abstract Bull.*, 8 (1935), A-1787.

3,4-Dihydroxyphenyl-β-amino Butanol—Modification of the Physiological Action of, by Substitution of a Methylamine Group for the Amine Group. It has previously been reported that 3,4-dihydroxyphenylamino butanol and 3,4-dihydroxyphenyl-β-methylamino butanol which have the pyrocatechol nucleus of adrenaline are exclusively hypotensives and vasodilators. This was found to be true in small doses but in larger doses these amines are distinctly hypertensives and vasoconstrictors. The methylamino compound is much less active than the amine as a hypertensive. This is similar to what has been observed with the corresponding propanols and ethanols but the variation is much greater with the butanols. It appears to increase with the length of the carbon chain.—RAYMOND HAMET. *Compt. rend.*, 202 (1936), 690. (G. W. H.)

Dysmenorrhea. The causes and types of this condition are discussed. The following formulas are offered: (1) Aspirin 2 grains, acetphenetidin 2 grains, ephedrine sulphate 1/8 grain. (2) Amidopyrine 3 grains, ephedrine sulphate 1/8 grain. –L. STAMBOVSKY. *Drug and Cosmetic Ind.*, 38 (1936), 200, 206. (H. M. B.)

Ephedrine-Glucose-Gum Solution. A routine for the treatment of the post-hæmorrhagic state is given in which the ephedrine-glucose-gum solution is employed. The reason for this solution is to employ immediate action in severe cases where blood donors are not readily accessible, that is, within an hour. However, transfusions are used to follow this emergency treatment.—W. HUNTER. *J. Obstet. Gyn., Brit. Empire*, 42 (1935), 5, 852; through *Brit. Med. J.*, 3915 (1936), 133. (W. H. H.)

Liver Fraction—Value of, in Pernicious Anemia. A total of 36 cases of pernicious anemia have been treated with Dakin and West's liver fraction, anahemin. The material has been compared with other liver preparations in respect to the production of reticulocyte responses, increase of red blood cells and clinical improvement. The data submitted emphasize the difficulty of assessing potency upon reticulocyte responses and red blood-cell increase in tests limited to a small number of cases. The results indicate, nevertheless, that anahemin, as prepared by the British Drug Houses Ltd., is highly active for blood regeneration in pernicious anemia. Total quantities of 1 to 6 cc. (100 to 600 mg., average amount 359 mg.) administered usually in divided doses, to 11 cases with initial red blood-cell counts below 2 millions per cc., were sufficient to cause an average increase of erythrocyte concentration amounting to 2.31 millions in 40 days. Good responses followed the administration of amounts sometimes as small as 10 mg. daily or 100–200 mg. as a single dose. For maximal reticulocyte responses and for the production of red blood cells at a maximal rate, larger doses were usually required. Preliminary observations suggest that this highly purified fraction may prove to be at least as potent as other liver extracts in the treatment of the neurological manifestation of pernicious anemia.—C. C. UNGLEY, L. S. P. DAVIDSON and E. J. WAYNE. *Lancet*, 230 (1936), 349. (W. H. H.)

Manganese Therapy of Furunculosis and Pustular Acne. Colloidal manganese hydroxide is a valuable adjuvant in the routine management of furunculosis, acne, indurata, pustular super-

ficial acne, rosacia with pustulation, pustular folliculitis and pyogenic infections of staphylococcus origin.—E. L. OLIVER and G. M. CRAWFORD. *Med. Rec.*, 43 (1936), 154. (W. H. H.)

Medicinals—Chemical Constitution and Effect of. There appears to be no direct relationship between chemical constitution and the biological behavior of medicinals. The biological effect of a substance is indirectly connected, however, with the size and constitution of the molecule since these affect the physio-chemical properties of the compound. The functional condition of the organism or of the organs or cells involved also plays a part.—W. SCHULEMANN. *Med. Chem. Abh. med., Chem. Forschungsstatten, I. G. Farbenind.*, 53 (1933); through *Squibb Abstract Bull.*, 8 (1935), A-1747.

Oxytocic Drugs—Use of, in the Post-partum Period. This paper represents an important addition to Moir's original paper on the action of ergometrine. He shows that the effect lasts much longer than was evident from his previous tracings, for 0.5 mg. of ergometrine by mouth will last as long as 0.5 mg. of ergotoxine when injected. He points out the dangers of prolonged administration of ergotoxine or ergotamine, since gangrene may follow.—CHASSAR MOIR. *Proc. Roy. Soc. Med.*, 28 (1935), 1654; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 758. (S. W. G.)

Pernicious Anemia—Development of Remedies for Treatment of. In an address the author deals at some length on the development of liver and stomach tissue preparations and makes a plea for utilization of official products which are standardized as to activity of the finished product. Ignorant or unscrupulous manufacturers have offered preparations of weak or uncertain potency and in view of the serious consequences which might follow the use of such undependable products, it devolves upon the pharmacist to supply only such preparations as are known to be trustworthy.—W. B. CASTLE. *Am. J. Pharm.*, 106 (1936), 55. (R. R. F.)

Pyrethrum Treatment of Scabies. The authors state that pyrethrum ointment affords an efficient agent for the treatment of scabies; it is non-irritant and has a pleasant odor. The ointment consists of an absorbent fatty base in which is dissolved the extractive matter of pyrethrum flowers. It contains 0.75% of pyrethrins (the active principles of the flowers); hence 100 Gm. of the ointment represents 83 Gm. of pyrethrum flowers.—S. E. SWEITZER and J. W. TEDDER. *Minnesota Med.* (Dec. 1935), 793; through *Brit. Med. J.*, 3921 (1936), 456B.

Seborrheic Dermatitis—Dandruff. The causes of this disorder are discussed. The following formulas are offered for its treatment: (1) Dr. Mansel Sympson's Lotion: Tr. Cantharides 1/2 oz., dilute acetic acid 1/2 oz., Spiritus Rosmarinis 1 oz., glycerin 1/2 oz., rosewater *q. s.* 8 oz. (2) Dr. Michie's Lotion: Solution mercuric chloride (4 grains to the ounce) 2 1/2 oz., solution potassium hydroxide (5%) 3 oz., water *q. s.* 6 oz. (3) Dr. Eigler's cure: Potassium hydroxide 6 grains, phenol 25 grains, lanolin 5 drams, coconut oil 4 drams. (4) Dr. Laird Pearson's Treatment: *No. 1 Lotion.*—Mercuric Chloride 30 grains, glycerin 5 oz., cologne water 5 oz.,water *q. s.* 15 oz. *No. 2 Lotion.*—Betanaphthol 2 drams, alcohol 1 pint. *No. 3 Oily Application.*—Salicylic acid 2 drams, Compound Tincture of Benzoin 1 1/2 oz., olive oil *q. s.* 10 oz. After shampooing, rinsing well and drying, rub in No. 1 Lotion and allow to dry, then No. 2 Lotion and allow to dry and finally apply the oily dressing and brush the hair and scalp thoroughly. (5) Tr. Cinchona 1 oz. solution potassium hydroxide 2 drams, potassium carbonate 1 dram, cologne water 1 oz., water *q. s.* ad 8 oz. (6) Resorcinol 1 dram, alcohol 7 1/2 oz., dissolve and add to castor oil 2 oz., balsam peru 1/2 oz., add perfume and filter. (7) Salicylic acid 5 drams, alcohol 1 pint, oil wintergreen 5 ♏, otto rose 1 ♏, oil neroli 1 ♏, heliotropin 2 1/2 grains, dissolve and add glycerin 10 oz. and water 10 oz. (8) Betanaphthol 5 drams, alcohol 15 oz., Tr. quillaja 15 oz., glycerin 10 oz., essence bouquet 6 oz. (9) *Dandruff Pomades.*—(*a*) Yellow mercuric oxide 10 grains, ammoniated mercury 4 grains, Camphor ointment (15% camphor in lard) 1/2 oz., oil neroli 3 ♏, otto rose 2 ♏. (*b*) Salicylic acid 30 grains, borax 15 grains, balsam peru 30 grains, petrolatum 1 oz., oil cinnamon 3 ♏, oil bergamont 10 ♏. (10) Ammoniated mercury 5.0 parts, salicylic acid 1.0, white wax 6.7, hydrous wool fat 3.3, petrolatum to make 100.0. (11) Mercuric chloride 0.0055 part, chloral hydrate 4.45, spirit of formic acid N. F. 8.40, perfume *q. s.*, alcohol (80%) to make 100.0. (12) Precipitated sulphur 6.7 parts, white wax 6.7, hydrous wool fat 33.3, petrolatum 100.0. (13) Precipitated sulphur 3.3 parts, salicylic acid 1.0, white wax 6.7, hydrous wool fat 33.3, petrolatum to make 100.0. (14) Resorcinol 4.0 parts, petrolatum to make 100. (15) Resorcinol 6 parts, glycerin 10, alcohol 9.6, water to make 100. (16) Euresol 3.3 parts, alcohol 56, distilled water 100. Mercuric chloride, salicylic acid, boric and formic acids, castor oil, glycerin may be added. (17) *White and Elliott's* Euresol

4.0 parts, mercuric chloride 0.12, spirit formic acid, N. F. 15, castor oil 2, alcohol to make 100. (18) Euresol 5 parts, white ceresin 25, coconut oil 70.—A. RICHARD BLISS, JR. *Drug and Cosmetic Ind.*, 38 (1936), 189–190, 192. (H. M. B.)

Sodium Pentothal—Value of, in Intravenous Anesthesia. In a series of over 1,000 cases there have been no deaths following the use of pentothal sodium, nor does any pathological process appear to have been aggravated. Vomiting was not witnessed after pentothal alone, but in a very small proportion of cases that had had premedication in addition to pentothal, and was much less than after an ordinary inhalation anæsthetic. It is regarded that sodium pentothal is a worthy addition to the life of safe and satisfactory intravenous anæsthetics.—R. JARMAN and A. L. ABEL. *Lancet*, 230 (1936), 422. (W. H. H.)

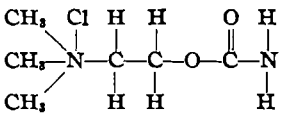
Vitamin A—Value of, in Infantile Medicine. The hepatic reserves of vitamin A after death supply definite indications which permit of judging as to whether or not there actually is avitaminosis A in the various morbid manifestations in which it is claimed to exist. In 8 cases of pleuropulmonary infection, the liver extract (amount corresponding to 0.5 Gm. of fresh organ) gave clearly positive results in 3 cases, while in 3 others no vitamin potency could be detected. It should be noted that in 3 cases considerable vitamin A reserves did not prevent fatal evolution of broncho-pneumonia; also, the duration of the disease seems to exert considerable influence, in two of the negative cases death having occurred only after more than 28 days; in these cases progressive anorexia and digestive disturbances are sufficient to account for the absence of vitamin A in the liver. Two cases were of infants 10 and 22 days old, respectively, who died in 2 and 8 days, and the vitamin A reserves of newborn infants are known to be normally non-existent; in the last case initial digestive disturbances and a previous diet can account for the absence of vitamin A. It is concluded that, when the disease lasts more than 10 days, it is indispensable to administer vitamin A, both in the course of the disease and during convalescence. In older children, considerable vitamin A reserves were always found in the liver, irrespective of the disease which caused death (diphtheria, tuberculosis, meningitis, pneumococcic infection), so that avitaminosis A is very exceptional, and a good varied diet during convalescence would seem to be sufficient without special addition of vitaminized products. In healthy infants, boiled cow milk and breast milk supply sufficient vitamin A, but condensed milk, milk powder and especially buttermilk can easily produce avitaminosis A and should be supplemented by a suitable source of this vitamin (carotene solution, cod liver oil or tomato juice).—R. DEVRÉ and A. BUSSON. *Bull. Soc. Péd.*, 32 (1934), 58; through *Bull. Soc. Sci. Hyg. Aliment.*, 23 (1935), 443–444. (A. P.-C.)

Whooping-Cough—Specific Vaccine in Treatment of. The position with regard to vaccine treatment, as judged by this investigation, would seem to be clear. The injection in the paroxysmal stage of large doses of a pertussis vaccine prepared in accordance with modern methods and beliefs is shown neither to curtail the duration of this disease nor to ameliorate the symptoms. Indeed the only effect obtained was an undesirable one, although not serious. It is noteworthy that no case in the vaccine or control series was fatal. This, in face of the not inconsiderable mortality which prevailed for the general run of cases in the epidemic appears to be a potent argument for the early hospitalization of whooping-cough.—N. D. BEGG and M. F. COVENEY. *Lancet*, 230 (1936), 82. (W. H. H.)

NEW REMEDIES

SYNTHETICS

Doryl is carbaminoylcholine chloride having the formula



It is stable both in the dry state and in solution, and aqueous solutions are not affected by heat. Like acetylcholine it stimulates the parasympathetic nervous system, and affects the vagus nerve and its associated organs. It is claimed that doryl has a stronger activity than other choline compounds. It possesses a higher resistance to ferments, and so remains active when absorbed by the digestive canal. It is a vasodilator and so causes a fall in blood pressure. In the alimen-

tary canal it increases the tonicity of the smooth muscles, strengthening the contraction of the stomach and large and small intestines. Doryl is suggested for the treatment of hypertonia and intestinal atony. Application of a 0.05% solution to the nasal mucous membrane has been successful in ozæna. It is also claimed to have a favorable effect in cases of contracture, due to joint-fractures, and also as a prophylactic in cases of fresh fractures during the time the joint is immobile in plaster. Doryl has been introduced electrophoretically into the body using a solution containing 0.001 Gm. per cc. This method is suggested for the treatment of rheumatism, arthritis and peripheral neuritis. The dosage internally is $^1/_2$–2 tablets of 0.002 Gm., and subcutaneously $^1/_2$–1 ampul of 0.00025 Gm. up to three times daily. The single rectal dose is 0.005 Gm. Doryl substance is supplied in boxes containing 3 tubes of 0.1 Gm. The tablets of 0.002 Gm. are supplied in tubes of 20, and bottles of 50. Ampuls of 0.00025 Gm. in 1 cc. are issued in boxes of 3 and 10. Doryl is also supplied in a 0.05% sterile solution for the treatment of ozæna in bottles of 20 cc.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 764. (S. W. G.)

Pavemal (Papaverine Phenylethylbarbiturate). To prepare this substance 23.2 Gm. of phenobarbitone is mixed with 100 cc. of alcohol (95%), a solution of 33.9 Gm. of papaverine in 150 cc. of alcohol (95%) is added, the mixture is heated on a water-bath with a reflux condenser for a few minutes until a clear solution is obtained, and this is filtered and allowed to crystallize. The product, papaverine phenylethylbarbiturate, to which the registered name "Pavemal" has been given, crystallizes in small white shining needles; m. p. 145–146°, practically insoluble in cold water, partly decomposed in hot water, soluble in hot alcohol, benzene and light petroleum and in cold acetone and chloroform, insoluble in ether. The curve of fusion of mixtures of phenobarbitone and papaverine shows that the product of mixing one molecule of each corresponds to a true combination and the elementary analysis shows proportions of carbon, hydrogen and nitrogen corresponding to the theoretical formula $C_{12}H_{12}O_3N_2.C_{20}H_{21}NO_4$.—A. Mossini and G. Recordati. *Boll. Chim.-farm.*, 74 (1935), 638; through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 712. (S. W. G.)

Specialties

Abidon is a preparation of vitamins A, B_1, B_2 and D in capsules. Each capsule is equivalent to 3 teaspoonfuls of cod liver oil in vitamins A and D and to 10 fluidounces of whole milk in vitamin B_1. The potency of each vitamin is established by biological standardization. The capsules are recommended for routine administration to growing children, prospective mothers and women who are lactating. Abidon is also suggested for administration to those whose diet is restricted. One to three capsules daily is usually sufficient, but four capsules can be taken daily if necessary. Abidon capsules are issued in bottles of 25.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 763. (S. W. G.)

Aklorep tablets contain betaine hydrochloride 8 grains (equivalent to 20 minims of dilute hydrochloric acid B. P.), and pepsin $^1/_3$ grain. They are indicated for the treatment of gastric disorders due to achlorhydria, and especially in cases of asthma and other allergic conditions. The dose is 1 tablet swallowed with a wine-glassful of water three times a day immediately before meals. Aklorep tablets are supplied in bottles of 50, 500 and 1,000 tablets.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 763. (S. W. G.)

Apondon (Dr. Wiernik, Berlin, Waidmannslust) consists of thyroid extract and ergocholine. According to the producers, ergocholine compensates for the side-actions of thyroid while preserving its therapeutic action on metabolism.—Rojahn. *Arch. Pharm.*, 274 (1936), 209.

Aquasana (Aquasana-Gesellschaft Beck & Bertele, Berlin-Steglitz) consists of lactic acid and is intended as an agent which makes possible the utilization of calcium and magnesium in water used for cooking, thus overcoming calcium deficiency. The acid is added to water before boiling to keep the calcium and magnesium in solution in the form of their lactates, instead of separating as the insoluble carbonates.—Rojahn. *Arch. Pharm.*, 274 (1936), 200.

Arbuz (Dr. Schwab G. m. b. H., München) appears in the form of tablets and combines the digestive action of a so-called "activated" papain with that of pepsin, trypsin and an eripsin-like action which is independent of the prevailing reaction of the gastric juices.—Rojahn. *Arch. Pharm.*, 274 (1936), 200.

Argidal (C. F. Boehringer Söhne, Mannheim-Waldhof) is a solution of acetylsalicylic acid hexamethylenetetramine with a silver content of 0.25%. It is believed to penetrate tissues readily

and there release formaldehyde. It is used in urological practice.—ROJAHN. *Arch. Pharm.*, 274 (1936) 201.

Betaxin (I. G.) is a vitamin B-1 preparation, for which the molecular formula is given as $C_{12}H_{16}N_4OS$. The vitamin is standardized in pigeon-units, corresponding to 0.0025 to 0.0035 mg. of the vitamin hydrochloride or the daily amount necessary to cure induced beri-beri in pigeons. —ROJAHN. *Arch. Pharm.*, 274 (1936), 212.

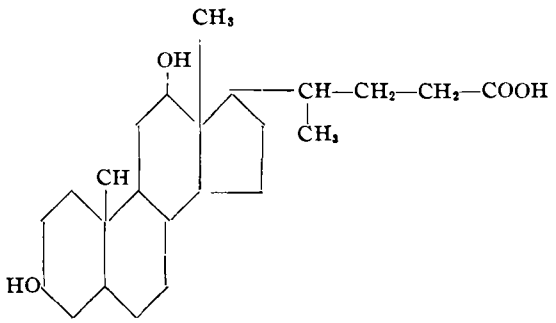
Blenomil (Desitinwerkes Carl Klinke, Hamburg) is a complex of silver fat and protein, to be used in the treatment of gonorrhea.—ROJAHN. *Arch. Pharm.*, 274 (1936), 201.

Calcydic granules contain in each teaspoonful, dicalcium phosphate $7^1/_2$ grains and vitamin D 1,500 units, which is equivalent to $2^1/_2$ fl. drachms of good cod liver oil. The granules are pleasantly flavored, and contain chocolate, glucose and sucrose. They may be given to children or adults, prophylactically, or therapeutically, in rickets, pregnancy, lactation, osteomalacia, menorrhagia, convalescence, chilblains and urticaria. The suggested dose of calcydic granules is from $^1/_2$ to 2 drachms taken either before or during meals sprinkled on bread and butter, or stirred into hot or cold milk. The granules are supplied in 8-oz. and 16-oz. tins.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 764. (S. W. G.)

Carbokaylene is a sweetened combination of colloidal kaolin with activated charcoal. It combines the detoxicating action of kaolin with the flatulence-reducing properties of activated vegetable charcoal and is recommended for the treatment of gastric flatulence and intestinal fermentation. It is supplied as granules and tablets. The dose suggested is 1–2 heaped teaspoonfuls, or 3–4 tablets three times daily between meals. The granules are supplied in 8-oz. and 4-lb. tins. Carbokaylene tablets are supplied in bottles of 40 and 750 tablets.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 764. (S. W. G.)

Carbolax tablets contain medicinal charcoal 7 grains, and diphenolisatine $1^1/_{64}$ grain. The tablets are suggested for the treatment of habitual constipation and poisoning. The medicinal charcoal used is claimed to be highly active, being fifty times as absorbent as ordinary charcoal. They are issued in bottles of 50 and 100 tablets.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 764. (S. W. G.)

Ceadon (Riedel de Haen A.-G., Berlin) is presumably a mixture of aloes and gallic acid, intended for use as a purgative. According to statements, it contains aloin-dihydroxy-cholanic acid.



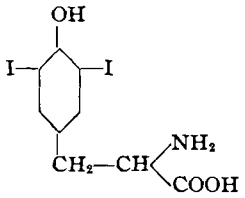
—ROJAHN. *Arch. Pharm.*, 274 (1936), 201.

Cholecysmon (Sächsisches Serum-Werk, Dresden) is a hormone-like substance, obtained from the walls of the gall bladder, which has an activating influence on lipase. It appears as a standardized extract, in ampul form, the unit of activity being the amount of activator required to double the lipase efficiency within three hours.—ROJAHN. *Arch. Pharm.*, 274 (1936), 212.

Desitin-Honigsalbe (Desitinwerke Carl Klinke, Hamburg 19) combines honey and raw cod liver oil in ointment form. Applied to necrotic and poorly granulating wounds, it is said to have produced good results.—ROJAHN. *Arch. Pharm.*, 274 (1936), 206.

Desitinolan-Wundsalbe, Balsaminsalbe, Combustin B, Hametium-Gadum-Salbe, Jodosellan-Salbe, Piroplasmin-Salbe, Alkopal and Pudan Kinderpuder are similar preparations of cod liver oil intended for topical application.—ROJAHN. *Arch. Pharm.*, 274 (1936), 206.

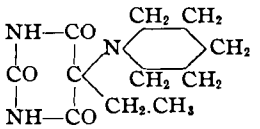
Diiodothyrosin (Ifah) is a thyroid preparation, having the formula



It diminishes the toxicity of thyroxin and the total thyroid principles.—ROJAHN. *Arch. Pharm.*, 274 (1936) 211.

Ekzemyl (Chem. Fabrik Dr. G. F. Henning, Berlin) consists of a fat and saponin-containing solution of coal tar and resorcin in ethyl chloride, for application as a spray in the treatment of eczema. This mode of application is supposed to afford the maximum curative effects from a minimum amount of medication.—ROJAHN. *Arch. Pharm.*, 274 (1936), 206.

Eldoral (Heyden, Radebeul) is a hypnotic, ethyl-penta-methylene-uramil, having the formula



—ROJAHN. *Arch. Pharm.*, 274 (1936), 202.

Emmenoplex is a standardized preparation of emmenin, the orally active œstrogenic hormone derived from human placenta. It is biologically standardized, and potency tests are repeated every three months to ensure its therapeutic activity. Emmenoplex is suggested for the treatment of menopausal disturbances, dysmenorrhœa, "menstrual" headache and oligomenorrhœa. It is claimed to be fully active by mouth, effective in small doses, and to produce more permanent results, than other œstrogenic substances. The dose is up to 1 fluidrachm three times a day diluted to half a tumblerful with fruit juice or water. Emmenoplex is issued in 4-oz. bottles.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 765. (S. W. G.)

Ephepyrin Nebula is a solution, in a glycerin base, of ephedrine hydrochloride, soluble benzocaine, adrenaline and chlorbutol. It is recommended for the treatment of nasal abnormalities in cases of asthma. When applied locally in the form of a fine spray it is claimed to give relief by constriction of the mucous membrane and reduction of swelling of the turbinates. The nebula is supplied in 1-oz. and 4-oz. bottles.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 765. (S. W. G.)

Ephepyrin Tablets contain pseudoephedrine, ephedrine hydrochloride, papaverine sulphate, calcium gluconate, amidopyrin, theophylline and benzyl succinate. This combination of depressant and stimulating drugs is recommended for the treatment of asthma, bronchitis and allied affections of the respiratory system. The prophylactic dose is 1 tablet swallowed whole, followed by hot tea or coffee, before breakfast. To prevent an impending attack, 2 tablets should be taken and the dose repeated in half an hour if necessary. Ephepyrin tablets are supplied in bottles of 12, 20, 100 and 250 tablets.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 765. (S. W. G.)

Eupronerv (Franz Schuster, Ichenhausen) is allegedly the product of years of study of the works of Paracelsus, Hahnemann, Much, Bier and Schulper. The constituents of the remedy include: ginseng, passifloro, avena sativa, cactus grandiflorus, citrus aurant, ambra, melissa, gelsemium, ignatia, potassium and phosphorus. It is intended for use as a heart tonic and to increase vitality.—ROJAHN. *Arch. Pharm.*, 274 (1936), 203.

Expit (Chem. Fabrik von Heyden, Dresden-Radebuel) is a 5% aromatic solution of Adhægon, which is a protein derivative exhibiting specific therapeutic action. The efficacy of the preparation is claimed to rest on the one hand upon its capacity to correct mucoid thrombus and on the other to remove the superficial layers of mucus from the mucous membranes.—ROJAHN. *Arch. Pharm.*, 274 (1936), 198.

Femaloid tablets contain manganese, iron, copper, thyroid, whole ovary, trioxymethylanthraquinone, magnesium hypophosphite and hyoscyamus. They are recommended as a tonic

restorative in the minor ailments of women. The dose suggested is 2 tablets three times a day after food. Femaloid tablets are supplied in bottles of 60 and 500.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 766. (S. W. G.)

Ferro-hepamult contains in each measureful (approximately 12 Gm.) the equivalent of 8 oz. of fresh liver and 1.7 Gm. of iron in the form of a ferrous salt. It is supplied in the form of granules which are taken dry on the tongue and swallowed with an adequate quantity of fluid. The granules must not be chewed or dissolved. Ferro-hepamult is suggested as a palatable and economical liver product for the treatment of anæmia. The dose is one or more measurefuls daily taken in one dose after a light meal. It is packed in 2-oz. and 16-oz. tins.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 766. (S. W. G.)

Formakaylene pastilles contain a condensation product of formaldehyde and kaylene, with the addition of a little menthol. It is claimed that the pastilles act as a detoxicating agent as well as a germicide. Formakaylene suspended in water destroys *Streptococcus hæmolyticus, Bacillus diphtheriæ* and *Staphylococcus aureus*. For the treatment of all acute infections of the throat, ulcerative conditions of the mouth and pharynx, and for pyorrhœa and gingivitis, 1 or 2 tablets should be dissolved slowly in the mouth every hour. Formakaylene pastilles are supplied in tins containing 30 tablets.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 766. (S. W. G.)

Gesanit (Dr. Herwarth Duisberg, Chem. pharm. Labor. G. m. b. H., Berlin-Britz) is a digestive ferment of vegetable origin, obtained from the East-Asiatic fungus *Aspergillus oryzæ*. It is supposed to contain a number of digestive ferments, including: a protein-digesting ferment, amylase, cellulase and hemicelluloase.—ROJAHN. *Arch. Pharm.*, 274 (1936), 200.

Gicht- und Rheuma-Allergine (Gudzent, Berlin) are allergic preparations of natural protein substances which, when injected intramuscularly, are said to allay or mitigate the pains of gout and rheumatism.—ROJAHN. *Arch. Pharm.*, 274 (1936), 205.

Halycitrol is a combination of halibut liver oil, orange juice and glucose. It is equal in content of vitamins A and D to its own volume of finest cod liver oil. It is palatable, enabling halibut liver oil to be taken without objection. The dose suggested is 1 teaspoonful three times daily. Halycitrol is supplied in 4-oz. and 8-oz. bottles.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 767. (S. W. G.)

Hepatotal (Dr. Laboschin, Berlin-Charlottenburg) contains the anti-pernicious anemia activity of liver and stomach released by ferments, with the addition of oxygen in an isotonic solution. Ten grams of Hepatotal correspond to 200–300 Gm. of fresh liver.—ROJAHN. *Arch. Pharm.*, 274 (1936), 209.

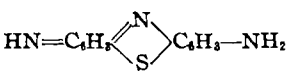
Homoseran Asid (Anhalt. Serum-Institut, Dessau) is a serum rich in hormone, obtained from pregnant women, to which has been added Jodhosan, a compound of iodine and thorium. It is to be given intramuscularly in puerperal sepis, toxemia of pregnancy, etc.—ROJAHN. *Arch. Pharm.*, 274 (1936), 210.

Heufieber Antigen Heko (Heco Fabrik Pharmaz. Präp., Wiesbaden-Biebrich) is a hay-fever antigen. It is claimed that after three injections the patients are free from symptoms. —ROJAHN. *Arch. Pharm.*, 274 (1936), 210.

Ichtoterpan is a combination of ichthyol, containing 10% of organic sulphur, with the terpenes of oil of turpentine, supplied in the form of tablets. It is indicated for the treatment of rheumatism, acne, furuncles, carbuncles and diabetes mellitus (economizing insulin). The dose recommended is 1 or 2 pills three times daily. Ichtoterpan pills are supplied in bottles of 25, 50, 100 and 200 pills.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 767. (S. W. G.)

Kalzium-Homburg (Chem. Fabr. Bad Homburg) is the calcium salt of *r*-glutamic acid. —ROJAHN. *Arch. Pharm.*, 274 (1936), 208.

Katalysin Henning (Dr. Georg Henning, Berlin-Tempelhof) is a 0.4% solution of Thionin, a compound chemically related to methylene blue, having the formula



It is supposedly free from the toxic side effects of methylene blue and is to be given intravenously in cardial asthma and chronic cardiac insufficiency as in carbon monoxide and narcotic poisoning. —ROJAHN. *Arch. Pharm.*, 274 (1936), 198.