ABSTRACTS OF PAPERS PUBLISHED IN OTHER JOURNALS

CHEMISTRY

ALKALOIDS

Fluosilicates of the Alkaloids. Janot and Chaigneau. (*C. R. Acad. Sci., Paris,* 1948, **227,** 982.) Knowledge of the fluosilicates of the alkaloids and related substances has been extended to the analysis and optical rotation of 13 alkaloidal fluosilicates. The fluosilicic acid was determined as the potassium salt in alcohol (50 per cent.); in the case of the morphine compound as the fluorochloride of lead. The alkaloid was liberated with ammonia and extracted with ether, chloroform or amyl alcohol. The fluosilicates crystallised easily in prismatic needles or plates; the quinine and quinidine compounds showed a blue, those of morphine and corynanthine a green, fluorescence. The general formula was SiF_6H_2 (alkaloid)$_2$ XH_2O, except the compounds of morphine and codeine, both of which were anhydrous. H. F.

ANALYTICAL

Colorimetric Determination of Copper with Carbon Disulphide and Diethanolamine. W. C. Woelfel. (*Anal. Chem.*, 1948, **20,** 722.) Use has been made of the reaction of the *bis*-(2-hydroxy-ethyl)-dithiocarbamate of diethanolamine with the cupric ion forming a brownish yellow salt soluble in water, as the basis of a colorimetric method for the determination of copper. The reagent is prepared by mixing solutions of carbon disulphide and diethanolamine, both in methyl alcohol. Several advantages are claimed over the ordinary diethyldithiocarbamate procedure in that the solubility of the coloured copper salt eliminates the need for a stabilising colloid or for extraction with an organic solvent. Of the metals whose compounds are soluble under the conditions used, bismuth, chromium, cobalt, iron, mercury, nickel, silver, and uranium interfere seriously. Procedures are described for eliminating the interference of appreciable amounts of bismuth, chromium, ferric iron, and uranium. Among the anions studied, only cyanide, dichromate, nitric, and sulphite interfered appreciably. R. E. S.

Ephedra and Ephedrine in Nasal Sprays, Assay of. Report No. 6 of the Poisons Sub-Committee of the Analytical Methods Committee of the Society of Public Analysts. (*Analyst,* 1948, **73,** 312.) The method of the British Pharmaceutical Codex, 1934, for the determination of the total alkaloids in ephedra was regarded as satisfactory. For the determination of ephedrine in sprays an aliquot portion of the spray is steam distilled in the presence of sodium chloride and sodium hydroxide, the ephedrine being collected in a standard excess of 0·05N sulphuric acid which is titrated against 0·05N sodium hydroxide. The distillation is continued until no further alkaloid is removed and the result is calculated as anhydrous ephedrine. R. E. S.

Ferric Chloride, Reactions of, in presence of Alcohol. L. Rosenthaler. (*Pharm. Acta Helvet.*, 1948, **23,** 271.) It is well known that the blue colour given by phenol with aqueous solutions of ferric chloride does not appear in dilute alcohol. If to 1 vol. of a 1 per cent. solution of ferric chloride

9 vols. of alcohol are added the solution after a time no longer gives the usual reactions of ferric salts. Apparently the whole of the iron is present in the form of a complex, or alternatively in a colloidal form. G. M.

***o*-Hydroxyquinoline Sulphate, Alkalimetric Titration of.** F. Reimers. (*Dansk Tidsskr. Farm.*, 1948, **22**, 181.) The pk_2 value for hydroxyquinoline was found to be about 10·6 (in 50 per cent. alcohol) and 11·4 (in 75 per cent. alcohol.) Thus the difference between pk_1 and pk_2 increases with increasing alcohol concentration. In addition, the colour of the titrated solution is brighter in alcohol than in water. The titration may be carried out as follows: 0·1 g. of *o*-hydroxyquinoline sulphate is dissolved in 20 ml. of alcohol (86 per cent. by weight) and titrated with aqueous 0·1 N sodium hydroxide to the colour change of bromocresol purple, or to a green colour with bromothymol blue. This method often gives higher results than bromimetric titration, showing the presence of excess of sulphuric acid.

G. M.

Methylene Blue Periodide as Volumetric Indicator. J. A. Gautier. (*Ann. pharm. Fr.* 1948, **6**, 171.) By the addition of iodine and hydriodic acid to methylene blue, a precipitate of the formula $B.HI.2I_2$ is obtained. This reaction may be used both in iodimetry and acidimetry. On the addition of a reducing agent, methylene blue is reformed, and gives a blue colour to the solution, while a larger quantity of a strong reducing agent decolorises the methylene blue forming the leuco base. A suitable indicator may be prepared by mixing a solution of methylene blue (0·0935 per cent.) with an equal volume of 0·01N iodine solution. This suspension should be used fresh. For iodimetry a drop or two is added to the solution being titrated just before the end-point, and titration is continued with thiosulphate until a blue colour appears in the solution. Alternatively, one drop of methylene blue solution may be added, though in this case there is a slight error equivalent to one drop of 0·01N iodine. This method is claimed to be superior to the use of starch. Since the compound is also decomposed by alkalis, it may also be used for acidimetric titrations but in this case it would not appear to offer any advantage over the usual indicators. G. M.

Starch in Plant Tissues, Determination of. G. D. Pucker, C. S. Leavensworth, and H. B. Vickery. (*Anal. Chem.*, 1948, **20**, 850.) The method consists of extraction of the starch from a 50 to 250 mg. sample of dried plant tissue with perchloric acid, precipitation with iodine under conditions that have been shown to be quantitative, decomposition of the starch-iodine complex and determination of the sugar produced by hydrolysis of the recovered starch. The results are independent of the composition of the starch of different species with respect to amylose and amylopectin content, in contrast to the colorimetric methods of starch estimation, but once the fundamental values for the starch from a given tissue have been determined in terms of sugar titrations and in comparison with a standard, e.g. a preparation of potato starch, the more rapid colorimetric method can be used in a series of determinations on the same tissue. For a variety of plant tissues results are accurate to within 2 per cent. E. N. I.

FIXED OILS, FATS AND WAXES

***dl*-Hydnocarpic Acid, Synthesis of.** D. G. M. Diaper and J. C. Smith. (*Biochem. J.*, 1948, **42**, 581.) The accepted structure assigned to

hydnocarpic acid has been confirmed by synthesis. The ester-acid chloride of sebacic acid reacts with ethyl sodioacetoacetate and the product yields a sodio derivative which reacts in the cold with *cyclo*-pent-2-enyl chloride to give a complex; this complex is hydrolysed mainly with the loss of the acetyl and carbethoxy groups to 10-ketohydnocarpic acid.

The keto acid was isolated as the semicarbazone which on heating with sodium ethoxide yielded *dl*-hydnocarpic acid. The synthetic acid did not depress the melting point of the natural *d*-acid and confirmation was obtained from the preparation and identity of the two dihydroderivatives in which there is no asymmetry. R. E. S.

BIOCHEMISTRY

GENERAL BIOCHEMISTRY

Ascorbic Acid, Pure, Stability of Solutions of, and of Dehydroascorbic Acid. P. Guild, E. E. Lockhart and R. S. Harris. (*Science*, 1948, **107**, 226.) Because there appears to be lack of agreement between the content of ascorbic acid in foods as measured by the 2 : 6-dichlorophenolindophenol method and the 2 : 4-dinitrophenylhydrazine method, the suitability of these two methods for determining ascorbic or dehydroascorbic acid has been compared. The effects of oxalic acid and metaphosphoric acid on the stability of ascorbic and dehydroascorbic acids in solution have also been investigated. It was found that the 2 : 4-dinitrophenylhydrazine method gave higher results than the other since the reagent reacts with products related to ascorbic acid which are biologically inactive; this may prove helpful when assaying the original vitamin C content and not the actual content. The method using 2 : 6-dichlorophenolindophenol gave results which closely resembled the biologically active content of ascorbic acid and dehydroascorbic acid. Ascorbic acid was found to be stable for at least 12 days when kept at 4°C. in a solution containing 5 per cent. of oxalic acid and 10 per cent. of acetic acid; in a solution containing 5 per cent. of metaphosphoric acid and 10 per cent. of acetic acid it was stable for at least 8 days under similar conditions. Dehydroascorbic acid was unstable in neutral solution at room temperature, and neither oxalic nor metaphosphoric acids prevented the irreversible change into biologically inactive forms. For stabilising ascorbic acid, oxalic acid was more effective, more stable, more convenient and less expensive than metaphosphoric acid. L. H. P.

B_t, a New Vitamin of the B Group. G. Fraenkel, M. Blewett and M. Coles. (*Nature*, 1948, **161**, 981.) The common mealworm, *Tenebrio molitor*, has been shown to be a very suitable test subject for folic acid and certain other, still unidentified, B factors. When grown on an artificial diet consisting of casein, glucose, water-insoluble fraction from yeast, cholesterol, a salt mixture, and aneurine, riboflavine, nicotinic acid, pyridoxine, pantothenic acid, choline chloride and inositol in ample amounts, at least two more factors are essential for growth and survival, namely, folic acid and a factor contained in a norite filtrate from yeast or liver extract; in the absence of both these factors growth is very slow and mortality high. The authors have tentatively named the norite filtrate factor B_t (to indicate its activity on *Tenebrio*). The reported absence of significant amounts of folic acid or the conjugate, pteroylheptaglutamic acid, in well known commercial parenteral liver extracts was fully confirmed in tests with *Tenebrio*.

Further tests to ascertain the possible B_t effects of these extracts, showed no effect with one of the extracts in any concentration, and a positive effect with another extract in only a very large dose. It is obvious that the kind of activity for which the anti-anæmic concentrates have been developed must be entirely different from that of folic acid or B_t. S. L. W.

Schiff's Reagent, Use of Thionyl Chloride in the Preparation of. J. C. Barger and E. D. DeLamater. (*Science*, 1948, **108**, 121.) 1·0 g. of basic magenta is dissolved in 400 ml. of distilled water, 1· ml. of thionyl chloride is added and the mixture allowed to stand for 12 hours. The decolorised solution is cleared by shaking with 2 g. of charcoal and filtering immediately. Alternatively, the treatment with charcoal may precede the addition of the thionyl chloride. The *p*H of the resulting solution is 1·24, as opposed to 1·38 for the solution prepared in the usual manner. When used in the Feulgen reaction, Schiff's reagent prepared with thionyl chloride is a successful nuclear stain for fungi, *Blastomyces dermatitidis* and *Saccharomyces cerevisiae*, in addition to tissue sections of human thymus, kidney, liver and spleen. G. B.

Vitamin B_{12} and Thymidine, for growth of *Lactobacillus lactis*. W. Shive, J. M. Ravel and R. E. Eakin. (*J. Amer. chem. Soc.*, 1948, **70**, 2614.) A medium previously described is modified by adding an oleic acid source, tween 80, 10 mg./10 ml., enzymatic digest of casein, 10 mg./ml. or clarified tomato juice, 0·5 ml./10 ml., and Wilson's liver fraction LR, 10 μg/10 ml. and replacing a phosphate buffer by sodium acetate. For the growth of *Lactabacillus lactus* Dormer, thymidine can replace liver extracts containing the principles active against pernicious anæmia, half-maximum growth stimulation requiring 1 to 3μg./10 ml. Thymine (100 μg./10 ml.) is inactive. Probably vitamin B_{12} functions in the biosynthesis of thymidine. In the medium containing tomato juice, 1 ml. of aerated water in 10 ml. can replace liver extracts; this effect is enhanced by adding ascorbic acid. Aerated water is not effective in the medium made with enzymatic digest of casein, but 1 mg. of ascorbic acid in 1 ml. of aerated water/10 ml., can replace liver extracts. G. B.

Vitamin D. Potency of the U.S.P. Reference Cod-liver Oil. W. Dasler, C. D. Bauer, and M. van Nostrand. (*J. Lab. clin. Med.*, 1947, **32**, 1251.) Three fresh samples of calciferol from entirely different sources, were dissolved in corn oil and repeatedly assayed against the U.S.P. reference cod-liver oil No. 2. The results indicate potency-values of 50 ± 2 units/μg. for all three samples. Similar bioassays of samples of parallel physical and chemical purity made in 1937-1938 against an earlier U.S.P. reference oil gave values of 40 units/μg. This discrepancy in potency-value, confirming repeated observations of recent teams of workers, can only be explained upon the hypothesis that the reference standard cod-liver oil is deteriorating, and should therefore be replaced, as regards vitamin D, by a primary standard, viz., pure crystalline vitamin D_3. F. J. D.

BIOCHEMICAL ANALYSIS

***p*-Aminosalicylic Acid in Blood and Cerebrospinal Fluid, Determination of.** W. Klyne and J. P. Newhouse. (*Lancet*, 1948, **255**, 611.) A colorimetric method for the determination of *p*-aminosalicylic acid in blood and cerebrospinal fluid has been developed. The procedure is as follows:— Add 0·5 ml. of oxalated whole blood or 1 ml. of cerebrospinal fluid to

7 ml. of water, mix until caking occurs, add 3 ml. of 20 per cent. *p*-toluenesulphonic acid, allow to stand for 5 minutes and filter through a No. 40 or 42 Whatman paper. To 5 ml. of the clear filtrate add 1 ml. of citrate buffer solution, 0·75 M, and 2 ml. of 2 per cent. (Ehrlich's) *p*-dimethylaminobenzaldehyde reagent. Read the colour intensity with a photoelectric photometer using a blue filter, e.g., Ilford No. 602. Use a reagent blank consisting of 1·5 ml. of *p*-toluenesulphonic acid, 1 ml. of citrate buffer and 2 ml. of Ehrlich's reagent and made up to 8 ml. with water. A calibration curve is constructed from 3 standards of sodium *p*-aminobenzoate corresponding to 20, 10 and 4 mg. of *p*-aminosalicylic acid per 100 ml. Streptomycin (1000 μg/ml. of plasma) does not interfere with the estimation but the method cannot be used if other primary aromatic amines are present. E. N. I.

Salicylates in Blood, Determination of. M. Volterra and D. M. Jacobs. (*J. Lab. clin. Med.*, 1947, **32**, 1282.) Salicylates may be determined by a simple and rapid method based on the xanthoproteic reaction, in volumes of 1 ml. of blood serum or plasma, deproteinated by trichloracetic acid. The yellow colour subsequently developed by the reagents is directly proportional to the concentration of salicylates as observed in recovery-values ranging from 5 to 80 mg. per cent. determined either photoelectrically or by direct vision against a standard series of potassium dichromate units. Good agreement was obtained between the authors' method and that of Coburn for values ranging from 5 to 55 mg. per cent. F. J. D.

Streptomycin, Identification on Paper Strip Chromatograms. R. E. Horne, Jr. and A. L. Pollard. (*J. Bact.*, 1948, **55**, 231.) A paper strip chromatographic method is described for detecting the presence of streptomycin in culture filtrates, etc., using 3 per cent. ammonium chloride solution as the solvent, the mechanism involved being a salting-out process. The paper strips are spotted near one end with the solution under test and the "spot" dried. They are then suspended, spotted end downwards, so that the lower ends are immersed in the ammonium chloride solution, the whole being placed in a closed container so as to maintain a saturated atmosphere. The solvent moves the streptomycin in a sharp band near the advancing solvent front. After 4 to 12 hours, when the solvent front has reached the desired height, the strips are dried and developed by means of a modification of the Sakaguchi reaction. The dry strip is sprayed with N/2 sodium hydroxide and immediately with 0·25 per cent. α-naphthol. After 2 minutes it is sprayed with sodium hypochlorite prepared as described by Sakaguchi. Streptomycin is shown as a brilliant red band. H. T. B.

Vitamin A, Simultaneous Comparative Carr-Price Reactions for Determination of. W. Koch and D. Kaplan. (*J. biol. Chem.*, 1948, **172**, 363.) The difference in rates of fading of the Carr-Price colour of graded concentrations of standard vitamin A, provides the basis of a photoelectric method in which standard and "unknown" are matched simultaneously thereby cancelling errors. Initially, the currents generated by two photocells receiving the light from two reaction tubes containing two different concentrations of vitamin A in Carr-Price reagent, were balanced on a galvanometer sliding bridge scale. When the differences in fading-rates in seconds, for graded concentrations of vitamin A standard in U.S.P. units were plotted against bridge-readings, it was observed that with falling concentrations the curves

flatten, change their slope and (at 10 units) approach the 80 per cent. transmission line, used as a convenient arbitrary standard. Subsequently, a calibration diagram was constructed by joining each of the predetermined bridge readings equivalent to fading values at 15 to 180 sec. in 15 sec. intervals, for concentrations of 50, 40, 30 and 20 units respectively, to the point of intersection of the 10 unit abscissa with the arbitrary "80" bridge ordinate. Determination of "unknowns" were then made by entering each bridge-reading as a dot on the appropriate seconds line, tracing the best fitting line through the points back to the abscissa, and reading the vitamin A in units/ml. Evidence is offered that values obtained by this method are in fair agreement with figures measured by ultraviolet absorption. F. J. D.

PHARMACY

DISPENSING

Oils and Fats, Sterilisation of. H. Hurni. (*Pharm. Acta Helvet.*, 1948, **23**, 283.) A number of methods are given in various pharmacopœias for the sterilisation of oils and fats. The ordinary conditions of sterilisation in an autoclave do not apply since water is absent, and in fact bacteria are killed in the same time at any temperature, whether they are in fat or in dry air. It has been shown that fats and oils as used for pharmaceutical preparations are nearly always sterile. Suitable methods for sterilisation are as follows: 4 hours at 140°C.; 3 hours at 145°C.; 2 hours at 150°C.; or filtration through a Berkefeld filter at 80° to 90°C. The Seitz filter is not effective for this purpose. G. M.

Vitamin A, Stability of, In Pills. P. Terp. (*Arch. Pharm. Chemi*, 1948, **55**, 513.) Pills were prepared according to the following two formulæ: I. lactose-starch granulate, 54 g.; vitamin concentrate, 8·4 g.; hydroquinone, 0·03 g.; aluminium oxide anhydrous, 9·6 g.; II. granulate, 41·4 g.; vitamin concentrate, 9 g.; hardened mustard oil, 12 g.; hydroquinone, 0·06 g.; aluminium oxide, anhydrous, 15·6 g. Both of these lost 40 per cent. in strength in 3 months. A further batch was made as above, with the addition of 0.25 per cent. of hydroquinone added to the granulate during granulation. These pills became black after a few days, and the vitamin was almost completely destroyed in a week. A number of pills were then made by the dropping method in which the molten mixture is solidified by dropping into cold alcohol (d. 0·883). Good results were obtained with the following formula: vitamin A concentrate (160,000 units/g.) 1 part; hardened arachis oil 8 parts; hydroquinone, 0·25 per cent. These pills showed a loss in strength of 12 per cent. after keeping for 12 months at ordinary temperature, and no loss over the same period in an ice chest. G. M.

GALENICAL PHARMACY

Penicillin Depot Preparations. J. Büchi and F. O. Gundersen. (*Pharm. Acta Helvet.*, 1948, **23**, 290.) Measures found effective for delaying the absorption of penicillin were: to avoid aqueous solutions, to surround the solid penicillin or sparingly soluble penicillin salt with an oil base, to choose the optimum degree of fineness, and to add substances (wax, adrenaline, aluminium stearate) which delay absorption. Certain proprietary preparations were effective, so that with these only one injection daily was necessary. Of the formulæ given, the following is the best; with an

injection of 1 ml., the effect lasts for more than 12 hours; and with 2 ml. for 24 hours; benzylpenicillin sodium cryst., 300,000 units; adrenaline, 0·3 mg.; sterile neutralised olive oil, to 1 ml. G. M.

Tincture of Iodine, Stability of. A. Tennøe. (*Dansk Tidsskr. Farm.*, 1948, **22**, 226.) An alcoholic solution of iodine, without potassium iodide, rapidly decomposes, and after 1 week's storage it already contains an amount of hydriodic acid greater than the limit allowed by the Danish Pharmacopœia (i.e. 0·13 per cent.). The reaction is apparently reversible, since if the preparation, after heating at 90°C, is then kept at ordinary temperature for some time, the acidity decreases and the free iodine increases. After 12 weeks' storage at 20°C., there was no appreciable difference between two preparations containing respectively 5·06 per cent. of iodine with 3·54 per cent. of potassium iodide, and 5·04 per cent. of iodine with 2·08 per cent. of potassium iodide. When kept at 90°C. for 4 weeks, the preparation with the smaller quantity of potassium iodide showed 50 per cent. more acidity than the other. G. M.

PHARMACOGNOSY

Hydrastis, Histological Peculiarities of its Adulterants. R. Lemesle. (*C. R. Acad. Sci., Paris*, 1948, **227**, 686.) Blaque and Maheu (Rev. gén. Bot. 1947, **54**, 138) have described the peculiarities of the pith and pericycle of the rhizomes of *Xanthorrhiza apiifolia* L'Hér. and of *Coptis Teeta* Wall, which are adulterants of *Hydrastis canadensis* rhizome. In this paper the xylem elements of these three rhizomes are described. Hydrastis rhizome has vessels with bordered pits, containing pectosic mucilage and of diameter 36 to 44μ. Wood parenchyma and fibres (without starch) are also present. In *Xanthorrhiza* the vessels are up to 55μ in diameter and have no bordered pits; parenchyma is absent. The fibres contain numerous spherical or polyhedral starch granules (4 to 6μ). In *Coptis*, narrow tracheidal vessels, such as occur in ipecacuanha, are present, maximum diameter 18μ. Parenchyma is absent and the fibres contain starch granules. J. W. F.

PHARMACOLOGY AND THERAPEUTICS

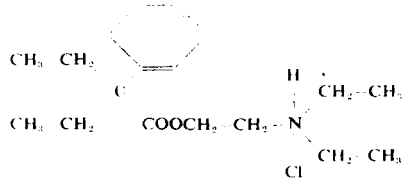
Caronamide, Effect on Penicillin Plasma Concentration in Children. M. Rapoport, F. B. Corneal, K. H. Beyer and W. F. Verwey. (*Amer. J. med. Sci.*, 1948, **215**, 514.) Oral administration of caronamide to children, in a dosage of 0·2 g./kg. of body weight per day, together with penicillin increased the concentration of penicillin in the plasma to from 1·8 to 2·8 times the control values obtained with penicillin alone. With a caronamide dosage of 0·4 g./kg. of body weight per day the penicillin concentration was increased by from 2·8 to 14·5 times the control concentration. Toxic symptoms during 1 to 2 weeks administration were not sufficient to warrant discontinuance of caronamide treatment. Renal function tests before and after treatment showed that the drug does not irreversibly affect kidney function. H. T. B.

Cuprelone, Trigeminal Neuralgia Treated With. A. M. G. Campbell. (*Lancet*, 1948, **255**, 690.) Cuprelone, cupro-allyl-thiourea-sodium benzoate, contains 19 per cent. of copper. It was introduced as a non-toxic substitute for gold compounds. It is supplied in dry ampoules, containing 10 to 100 mg. and is dissolved in sterile distilled water for intravenous

injection; 100 mg. produced a rise in blood-copper level for 2 hours after injection. All the extra copper is probably excreted during the next 2 or 3 weeks. It was administered in 13 cases of trigeminal neuralgia and in some the pain was relieved; its toxic effects were negligible. H. F.

Dipole Moment and Physiological Activity. B. Melander. (*Farm. Revy*, 1948, **47**, 503.) In the hexachloro*cyclo*hexane series, maximum insecticidal activity is shown by the isomer with a dipole moment in the region of 4D; the two isomers with no dipole moment are inactive. A similar effect is observed with the same compound in the production of total colchicine mitosis in *Allium Cepa*. Local anæsthetic bases (procaine and xylocaine) have a moment about 4D, whereas the group of aliphatic alcohols and benzyl alcohol have moments 1·7 to 2 D. The latter group, unlike the former, do not produce convulsions when injected intravenously. Ether and chloroform have dipole moment 1·15 D. G. M.

Parpanit, Treatment of Parkinsonism with. W. F. Dunham and C. H. Edwards. (*Lancet*, 1948, **255**, 724.) The effects of parpanit, a synthetic compound, closely related to trasentin and pethidine (dolantin), and having the structural formula



were investigated in 25 cases of Parkinsonism, in all of which treatment with solanaceous drugs had been given for more than a year. The results showed no striking difference from those obtained with solanaceous drugs. The optimum individual dose varied from 0·025 to 0·1 g., usually 3 to 4 times a day. The side effects of parpanit, although similar to those of the solanaceous drugs, differed sufficiently in intensity and frequency to make it the drug of choice for some patients. E. N. I.

Penicillin Aluminium Salt in Mouse Protection Tests. R. D. Reid. (*Proc. Soc. exp. Biol. N.Y.*, 1947, **66**, 605.) Aluminium penicillin is a water-insoluble salt which has been administered in arachis oil suspension. A dose of 300,000 I.U. given intramuscularly to human subjects has been found to give blood levels of 0·03 I.U./ml. for 12 to 24 hours. The author compared the dosage required to give a survival rate of 50 per cent. in mice infected intraperitoneally with 1000 M.L.D. of a diluted culture of *Diplococcus pneumoniæ* Type 1, with the dosage of sodium penicillin in oil and wax and calcium penicillin in oil, giving injections for 14 days. The figures obtained were respectively 34 units, 40 units and 95 units.

H. T. B.

Penicillins F, G, K and X; Relative Antisyphilitic Activities. H. Eagle and R. Fleischman. (*J. Bact.*, 1948, **55**, 341.) The antisyphilitic activities of penicillins F, G, K and X, and of bacitracin were evaluated by a method based on the fact that an extremely small amount of treatment is sufficient to terminate syphilitic infection in rabbits, provided it is administered soon after inoculation and before the appearance of the primary lesion. Rabbits were inoculated intradermally with 2,000 *Treponema*

pallidum, and treated 4 days later with intramuscular injections of the various penicillins or bacitracin, repeated once daily for 4 days. It was found that penicillins F, K and X were approximately 8, 12 and 14 per cent. respectively as active as penicillin G, and a crude preparation of bacitracin assaying at 30 units/mg. was 10 per cent. as active. Comparison of the results obtained with those of other workers shows that the absolute and relative activities of the various penicillins and of bacitracin vary widely according to the method of assay. H. T. B.

Penicillin Suspension with Adrenaline for Gonorrhœa. A. Cohn and B. A. Kornblith. (*Amer. J. med. Sci.*, 1948, **215**, 506.) A total of 300 male ambulatory patients with acute gonococcal infections were treated intramuscularly or subcutaneously with a single dose of suspension of potassium penicillin in oil containing adrenaline. The suspension contained 300,000 units of potassium penicillin and 0·3 mg. of adrenaline in 1 ml. of vegetable oil, and dosage varied between 0·25 and 1 ml. Only exceptionally were 2 ml. doses used. Single injections of 150,000 units cured 97 of 100 patients treated, the criteria of cure including a bacteriological and clinical check for 2 or 3 weeks after treatment. The other 3 cases were promptly cured by a second injection of the same amount, indicating that the relapse strain had not become resistant to penicillin. All of 19 patients treated with 200,000 units in 1 ml. intramuscularly were cured. A table gives the results obtained on 154 of the patients treated, the remainder of the 300 not attending for final determination of cure. No untoward local or systemic reactions were observed. H. T. B.

Salicylazosulphapyridine, Therapeutic Action of. N. Svartz. (*Bull. schweiz. Akad. med. Wiss.*, 1948, **3**, 311.) It has been shown that all acid azo compounds have a marked affinity for connective tissue, particularly tissue rich in elastin; and their localisation in such tissues may be detected microscopically by the fluorescence. Such compounds should therefore be effective in ulcerative colitis and rheumatic polyarthritis. Cases of colitis were treated usually with 1 g. of salicyazosulphapyridine 6 times a day, the dose being decreased as the symptoms improved. It was found necessary to continue the treatment over a long period with 0·5 g. 2 to 3 times a day. Results of 119 cases show a considerable improvement or cure in 108 of them. For acute polyarthritis, 100 patients were treated (some with salicylazosulphathiazole) in the period 1941 to 1945. In 1947, 92 were reported free from symptoms. The results for chronic polyarthritis were less satisfactory, only about 40 per cent. showing any considerable improvement. Although the administration was generally *per os*, periarticular injection was sometimes useful. G. M.

Streptomycin, Effects on *Mycobacterium tuberculosis* Infection by Inhalation. C. Levaditi, A. Vaisman and P. Lévy. (*C. R. Acad. Sci., Paris*, 1948, **227**, 987.) Mice were infected by injection with *Mycobacterium tuberculosis*, human strain H 512, and 30 were kept in an atmosphere containing streptomycin introduced under a pressure of 0·5 kg. for 6 hours a day for 6 weeks. The total amount of drug evaporated during this period amounted to 22 mega-units. Another batch of 20 mice were infected and kept as controls without treatment. Of these all died within 29 days. Of the mice treated with streptomycin, one died on the 46th day, the remainder were then destroyed and examined. From the results it appeared that streptomycin undoubtedly exerted therapeutic activity.

although it was lower than that showed by the subcutaneous injection of 1,000 to 2,000 units daily. H. F.

Tetra-ethyl pyrophosphate in Myasthenia Gravis. A. S. V. Burgen, C. A. Keele and D. McAlpine. (*Lancet*, 1948, **254**, 519.) T.E.P.P. was given to 3 patients either as a 0·5 per cent. solution in propylene glycol, intramuscularly, or as a 2 or 5 per cent. solution in propylene glycol, orally. By injection, it was found to be from a third to half as potent as prostigmine but its action lasted about twice as long. Side effects, similar to those produced by prostigmine, were experienced, but the action on the gut producing colic and diarrhœa was prevented by atropine. G. R. B.

BACTERIOLOGY AND CLINICAL TESTS

Aerosol OT, Synergistic Effect of, on Certain Germicides. G. V. James. (*J. Soc. chem. Ind., Lond.*, 1948, **67**, 336.) Rideal-Walker coefficients for dispersion of certain germicides in a 20 per cent. solution of a neutral castor oil soap show the following increases on the addition of 0·1 per cent. w/v of aerosol OT (di-octyl-sodiumsulphosuccinate):—phenol (1 per cent.), 0·6; cresol (1 per cent.), 0·9; *p*-chloro-*m*-xylenol (2 per cent.), 1·1; butylphenol (2 per cent.), 1·1; benzylcresol (2 per cent.), 1·6; cresantol-15 (3 per cent.), 2·2. Similar results are obtained with 0·4 per cent. of a commercial product described as the *bis*-ester of sodium sulphonated dicarboxylic acid. The increased germicidal activity appears to be stable over at least 4 months at room temperature. The use of sulphonated castor oil instead of castor oil soap results in a smaller enhancement of R.W. co-efficient. *Bacillus typhosus* was used as the test organism and 0·02 ml. pipettes replaced platinum loops to prevent errors due to differences in surface tension. G. B.

Penicillin: Induced Resistance and Oxygen Utilisation. W. D. Bellamy and J. W. Klimek. (*J. Bact.*, 1948, **55**, 147.) The observation that penicillin-resistant staphylococci grow more slowly than the parent strain, and almost exclusively at the surface of broth cultures, was confirmed on a penicillin-sensitive strain of *Staphylococcus aureus*, and a penicillin-resistant variant of this strain. Growth curves under aerobic and anaerobic conditions showed that the penicillin-resistant variant grew more slowly than the parent-sensitive culture, and had lost the ability to grow anaerobically. Strains of *Streptococcus fæcalis, Strep. mastitidis* and *Clostridium welchii* when treated in a similar manner failed to develop resistance to penicillin. It is suggested that the development of resistance is dependent on the power to grow under aerobic conditions. H. T. B.

Penicillin-Resistant Staphylococci. W. D. Bellamy and J. W. Klimek. (*J. Bact.*, 1948, **55**, 153.) The properties of penicillin-resistant variants of *Staphylococcus aureus* have been compared with those of the parent sensitive culture. The variant was 60,000 times more resistant to penicillin than the original culture, was Gram-negative, and had lost the ability to grow anaerobically. Increase in resistance is accompanied by a progressive loss of fermentative activity, but the resistant variant can synthesise nicotinic acid in quantities sufficient for growth. It produces an extracellular penicillinase when grown in the presence of penicillin. Serial transfers through a deficient medium will cause a reversion from Gram-negative rods to the original Gram-positive staphylococcus forms which have lost most of their resistance. H. T. B.