BRITISH CHEMICAL ABSTRACTS

A., III.—Biochemistry

FEBRUARY, 1937.

Nervous control of gaseous exchange. M. Politzer (Arch. Farm. sperim., 1936, **62**, 108—116).—The ventilation equiv. of O_4 (*i.e.*, amount of air of respiration or ventilation necessary for the utilisation of 100 c.c. of O_2) is diminished in man by administration of ergotamine. The pulmonary O_2 consumption is regulated not only by the vagus but also by the sympathetic nervous system. F. O. H.

Effect of hæmolytic substances on white cell respiration. E. Ponder and J. Macleod (J. Gen. Physiol., 1936, **20**, 267—281).—The O_2 consumption of white cells from rabbit peritoneal exudates is markedly reduced, owing to cytolysis, by saponin, bile salts, or Na oleate. Much larger (× 35) amounts of the lysin are required to reduce the respiration of white cells than to hæmolyse red cells. The lysin combines with the white cells. Freezing and thawing, or immersion in hypotonic NaCl solutions, also reduces the respiration of white cells. F. A. A.

Adsorption at surfaces of red cells. B. R. Monaghan and H. L. White (J. Physical Chem., 1936, **40**, 1063—1070; cf. A., 1936, 1399).—Contrary to the statement of Bellis and Scott (A., 1935, 1393) normal red cells do not adsorb measurable quantities of gelatin or plasma-proteins. Addition of lecithin inhibits the sedimentation of dog cells in plasma or gelatin owing to absorption by the lecithin decreasing the effective protein concn. F. L. U.

Sedimentation of erythrocytes in globulin solutions. S. P. Lucia, S. M. Gospe, and J. W. Brown (Proc. Soc. Exp. Biol. Med., 1935, **33**, 356—358).—No relationship was traced between the rate of sedimentation of erythrocytes in solutions of human and ox serum-globulin (I) and the (I) content of the solutions. W. McC.

Formation of methæmoglobin by aniline. W. Heubner and G. Schwedtke (Arch. exp. Path. Pharm., 1936, **184**, 80—82).—Since on subcutaneous injection into cats of aq. NH_2Ph the mol. ratio of injected NH_2Ph to methæmoglobin formed is <1, the view that NHPh·OH is formed as an intermediate is discountenanced in favour of the view that the *p*-aminophenol–iminoquinone system is formed and acts catalytically. P. W. C.

Photo-electric method for recording fast chemical reactions and its application to the study of catalyst–substrate compounds.—See A., I, 100.

Separation of serum-albumin into two fractions. I. L. F. Hewitt (Biochem. J., 1936, **30**, 2229—2236; cf. A., 1935, 256).—The fractions were obtained from the plasma of horse's blood by fractional pptn. with $(NH_4)_2SO_4$. The properties of the least sol. cryst. and the most sol. fractions were respectively: carbohydrate content 0·5 and 8·5%, N content 14·4 and 13%, NH_2-N content 1·0 and 0·65%, $[\alpha]_{5461}$ −70·8° and −57·1°, coagulation temp. 60° and 80°, tryptophan content 0·26 and 1%, tyrosine content 4·79 and 5·38%. The fraction most sol. in aq. $(NH_4)_2SO_4$ yields much humin on hydrolysis with HCl whilst the cryst. fraction remains colourless. W. McC.

Protein equilibrium of serum in histamine shock. N. Fiessinger, A. Gajdos, and E. Panayotopoulos (Compt. rend. Soc. Biol., 1936, **123**, 967—969).—Intense histamine shock in dogs without anæsthesia increases serum-globulin and decreases -albumin. H. G. R.

Protein content of the blood-plasma of insects. M. Florkin (Compt. rend. Soc. Biol., 1936, **123**, 1024—1026).—The vals. for the species studied were Orthoptera (*Dixippus morosus*) 1·03, Lepidoptera (*Bombyx mori*) 1·96, Coleoptera (*Hydrophilus piceus*) 3—4, and Hymenoptera (*Bombus agrorum*) 5%. H. G. R.

Dependence on urea of "residual nitrogen-difference" in blood and urine. H. Thelen (Biochem. Z., 1936, **288**, 338—347).—The residual N difference (I) [*i.e.*, the difference between $CCl_3{\cdot}CO_2H$ and phosphotungstic acid (II) pptns. of residual N] of blood depends on urea concn., high vals. of which cause increased pptn. of N by (II). (I) in urine is independent of urea concn. but is increased by dilution *in vitro* and diminished by dilution *in vivo* (H_2O diuresis). F. O. H.

Variation in blood-sugar with blood-nitrogen. J. Loiseleur (Compt. rend. Soc. Biol., 1936, **123**, 946—949).—Hyperglycæmia occurs when blood-urea is increased. H. G. R.

Effect of blood from depancreatised dogs on blood-sugar of normal dogs. F. Rathery, Bargeton, and de Traverse (Compt. rend. Soc. Biol., 1936, **123**, 1036—1038).—Hyperglycæmia is observed in most cases, but sometimes this is replaced by hypoglycæmia. H. G. R.

Reducing and fermentable substances in the body-fluids of *Arenicola*, *Dasybranchus*, and *Sipunculus*. M. Florkin (Compt. rend. Soc. Biol., 1936, **123**, 1022—1024).—The cœlomic plasma contains 0, 8—9, and 2·2—8·7 mg. of reducing substance (as glucose) per 100 c.c., respectively, whilst the

blood-plasma of *Arenicola* contains 12 mg. per 100 c.c. H. G. R.

Cerimetric determination of glucose in 0·01 c.c. of blood. R. Vanossi and R. Ferramola (Biochem. Z., 1936, **288**, 369—374).—The authors' method (A., 1936, 968) for 0·1 c.c. is modified for 0·01 c.c. of blood. Deproteinisation is effected by $Al(OH)_3$. F. O. H.

Determination of blood-carotene. E. Daniel and G. J. Scheff (Proc. Soc. Exp. Biol. Med., 1936, **33**, 26—30).—Details of the method are given. It is unsuitable for blood containing lycopene. Xanthophylls are removed by treating an Et_2O–light petroleum solution with MeOH. P. G. M.

Direct determination of oxalic acid in blood. S. Suzuki (Z. physiol. Chem., 1936, **244**, 235—237; cf. A., 1934, 1122).—A reply to the criticisms of the author's method (Thomsen, A., 1936, 223). W. McC.

Silicic acid content of blood of puppies inhaling quartz dust. M. Schönfelder (Arch. Hyg. Bakt., 1936, **117**, 44—52).—The SiO_2 content of the blood of puppies inhaling quartz dust for periods of 1 to 12 months was increased by 130% (from 1·4 to 3·3% of the sulphated ash). Intravenous injection of tubercle bacilli raised the SiO_2 content by 17%. W. L. D.

Diffusible and non-diffusible calcium of blood following overdosage with parathyroid hormone or irradiated ergosterol. J. F. Sykes (Trans. Roy. Soc. Canada, 1936, [iii], **30**, V, 27—30).—In dogs there is an increase in the ratio of non-diffusible to diffusible Ca. J. N. A.

Permeability of tissue cells to potassium. J. I. Thaler (Proc. Soc. Exp. Biol. Med., 1935, **33**, 368—371).—In cats the [K] in plasma and in whole blood increase as the circulatory vol. decreases (bleeding). The concn. returns to normal if the vol. is subsequently increased by re-injection of the blood or by injection of saline solution. Injection of adrenaline causes transitory and that of histamine more prolonged increases in plasma-K. W. McC.

Distribution of iron and zinc in blood plasma, the protoplasm of blood corpuscles and their nuclei, in different animals. N. Yakusizi (Keijo J. Med., 1936, **7**, 276—288).—The Fe content of blood from the stork, Japanese crane, toads, and bony and cartilaginous fish increases with a rise in the animal scale. The total Fe of corpuscle nuclei is $\ll$ that in the surrounding protoplasm or whole blood. Blood-Zn increases with a descent in the animal scale, and the Zn content in the nuclei is $>$ that in nuclear protoplasm or whole blood. F. A. A.

Distribution of iron and zinc in plasma, protoplasm, and nucleus of different kinds of pus, and the biological significance of these metals. N. Yakusizi (Keijo J. Med., 1936, **7**, 289—300).—In the plasma (I), corpuscle protoplasm (II), and corpuscle nuclei (III) of pus from both acute and chronic discharging conditions, the Fe content is in the order (II) $>$ (III) $>$ (I). The Zn, in acute pus, gives (III) $>$ (II) $>$ (I), in chronic pus (II) $>$ (I) $>$ (III). The amounts of Fe and Zn range from about 1 to 10 mg. per 100 g. of dry substance. F. A. A.

Effect of intravenous injections of suspensions of solids on blood-chloride. A. Lumière, P. Meyer, and H. Vergne (Compt. rend. Soc. Biol., 1936, **123**, 906—908).—In addition to hyperglycæmia and hypoproteinæmia, injection of suspensions of inert solids causes a hyperchloræmia the intensity of which depends on the physical nature of the particles. H. G. R.

Physical chemistry of fish blood. A. Drilhon and G. Florence (Arch. Phys. biol. Chim.-Phys. Corps, 1935, **12**, 180—198; Chem. Zentr., 1936, i, 1249).—Buffer curves of the serum together with cataphoretic measurements show the similarity of sera of sea- and fresh-H_2O fishes and the differentiation of those of Elasmobranchii. A. G. P.

Histochemical demonstration of removal and fixation by dielectrolysis of ions previously introduced into the blood. G. Bourguignon and M. Monnier (Compt. rend. Soc. Biol., 1936, **123**, 975—978). H. G. R.

Water and electrolyte distribution in plasma, red blood cells, and muscle after adrenalectomy. A. H. Hegnauer and E. J. Robinson (J. Biol. Chem., 1936, **116**, 769—778).—In adrenalectomised cats, the plasma-osmotic pressure remains unchanged, but the Na and K levels are greatly reduced, rendering the plasma hypotonic to the red cells. Simultaneously with an uptake of H_2O by the red cells there is an outward migration of Na. The K content of both plasma and red cells increases but the latter increase does not compensate for the Na decrease. An intracellular increase of total H_2O may occur in muscle. The K content also increases so that the high plasma-K is not due to liberation of K from muscle. E. A. H. R.

Water and electrolyte distribution between plasma and red blood cells after intraperitoneal injections of isotonic glucose. E. J. Robinson and A. H. Hegnauer (J. Biol. Chem., 1936, **116**, 779—786).—The plasma of cats and rabbits after injection of glucose shows changes in electrolyte content similar to those in adrenal insufficiency (cf. preceding abstract). When the electrolyte balance of plasma is sufficiently altered, the red blood cell membrane probably becomes more permeable to cations. E. A. H. R.

Does the blood–cerebrospinal fluid equilibrium obey Donnan's or Derrien's law? Y. Derrien (Compt. rend. Soc. Biol., 1936, **123**, 911—913).—Experimental results agree with those predicted from Derrien's law. H. G. R.

Determination of p_H of blood and other biological fluids by the glass electrode. L. Seekles (Biochem. Z., 1936, **288**, 402—408).—The application of the glass electrode to the determination of p_H (with an accuracy of 0·01—0·02) of blood and fluids containing CO_2 or protein fission-products is described. F. O. H.

[In-]applicability of the antimony electrode to the determination of p_H [of blood].—See A., I, 96.

Influence of male and female sexual hormone preparations on blood coagulation. C. Bablik (Münch. med. Woch., 1935, **82**, 1679; Chem. Zentr., 1936, i, 1246).—Injection of the preps. two months after castration prolonged the coagulation period. A. G. P.

Evidence for the presence of a diffusible organic substance in blood which accelerates blood clotting. C. E. Larson and D. M. Greenberg (Proc. Soc. Exp. Biol. Med., 1935, **33**, 305—307).—Thoroughly dialysed blood plasma, redissolved in H_2O containing the known dialysable constituents of blood, including Ca, does not clot until a small quantity of serum ultrafiltrate is added. The active serum constituent is org., and is not species-sp. W. O. K.

Structure of natural and synthetic antigens. M. Heidelberger (Science, 1936, **84**, 498—501).—An address. L. S. T.

Inhibition of the fixation reaction in presence of Besredka's antigen by the serum fraction precipitable by hydrochloric acid. C. Auguste and E. Rigaud (Compt. rend. Soc. Biol., 1936, **123**, 917—919). H. G. R.

Purified Forssman preparations. E. Brunius (Arkiv Kemi, Min., Geol., 1936, **12, B**, No. 18, 3 pp.).—Purified Forssman hapten (I) preps. contain a carbohydrate. This is probably an NH_2-sugar (II) on account of the correlation between the amount of (II) and the (I) content in various preps. Acid hydrolysis of (I) yields fatty acids. Cobra venom does not inhibit (I). E. A. H. R.

Influence of aminophenylarsinates on the toxin–antitoxin complex. H. Goldie (Compt. rend. Soc. Biol., 1936, **123**, 883—887).—The salt is adsorbed by the complex and pptd. in dil. solutions of the toxin, an opalescence appearing in conc. solutions. H. G. R.

Resistance to heat of antibodies isolated from serous media. K. Meyer and A. Pic (Compt. rend. Soc. Biol., 1936, **123**, 935—936).—The thermolability of the antibodies is independent of the serum in which they occur. H. G. R.

Specific polysaccharide of the type I pneumococcus. M. Heidelberger and F. E. Kendall (Proc. Soc. Exp. Biol. Med., 1935, **33**, 445—446; cf. following abstract).—The acetylated polysaccharide (I) obtained from type I pneumococcus resembles that obtained by Avery *et al.*, but the η of its solutions is much higher and it ppts. twice as much antibody-N from type I antipneumococcus rabbit serum. The power of acetylated (I) to ppt. antisera from rabbits is diminished by heating but the reaction with antisera from horses is scarcely affected. W. McC.

Preparative changes necessitated by a quantitative study of precipitating power of pneumococcus polysaccharides. M. Heidelberger, F. E. Kendall, and H. W. Scherp (Proc. Soc. Exp. Biol. Med., 1936, **33**, 188—190).—The method of prep. was modified to avoid possible degradation by acid and the initial concn. of the autolysed cultures at 100° was omitted. The product pptd. up to 50% more antibody from rabbit serum and had a higher η. P. G. M.

Photodynamic action of methylene-blue on diphtheria toxin. F. C. Lin (Proc. Soc. Exp. Biol. Med., 1935, **33**, 337—338).—Hamsters receiving injections of unexposed toxin plus the dye or of exposed toxin without the dye died in $\not>3$ days, but those receiving injections of toxin plus dye exposed to sunlight or electric light usually survived. Sunlight is more effective than electric light. W. McC.

Hæmolytic complement albumin–globulin ratio. M. C. Terry (Proc. Soc. Exp. Biol. Med., 1935, **33**, 205—207).—If fresh cell-free guinea-pig serum is repeatedly frozen and thawed in a test-tube, the proteins tend to be conc. in the lower half, which exhibits a higher complement titre and also a higher albumin–globulin ratio than the original serum. W. O. K.

Immunological potency of globulin prepared by precipitation with methyl alcohol. F. T. Chu and C. Y. Chou (Proc. Soc. Exp. Biol. Med., 1935, **33**, 323—326).—Dry globulin (I) obtained from extract of human placenta by pptn. with MeOH is as potent in neutralising Dick toxin and protecting against measles as is (I) obtained by pptn. with $(NH_4)_2SO_4$. W. McC.

Anti-endocrine gland precipitins and longevity in vertebrates. C. Picado and W. Rotter (Compt. rend. Soc. Biol., 1936, **123**, 869—871).—The longer is the normal life of the animal the greater is the concn. of precipitin. H. G. R.

Effect of ascorbic acid on chemical tests for blood. J. F. Barrett (Lancet, 1936, **231**, 1214).—Ascorbic acid interferes with the benzidine and guaiacum tests for blood in pathological specimens, which should be boiled, acidified with AcOH, and extracted with Et_2O before test. L. S. T.

Biochemistry of the lens. D. R. Campbell (Brit. Med. J., 1936, No. 3961, 1133—1136).—A review. A. G. P.

Nucleotide nitrogen content of certain tissues of the dog and rabbit. J. J. Eiler and F. W. Allen (Proc. Soc. Exp. Biol. Med., 1935, **33**, 208—209).—Analytical data are recorded. W. O. K.

Determination of pyruvic acid in muscle. A. Hahn, H. Niemer, and I. Fischbach (Z. Biol., 1936, **97**, 582—584).—Modifications in the method of Hahn and Niemer (A., 1934, 796) are described. If hexose diphosphate is present it is pptd. with colloidal Fe after deproteinisation. When methylene-blue (I) is present, it is reduced by H_2S and on deproteinisation the leuco-(I) remains adsorbed on the muscle residue. E. A. H. R.

Highly unsaturated C_{28}-fatty acids in Hokke oil. S. Ueno and M. Iwai (Bull. Chem. Soc. Japan, 1936, **11**, 643—649).—Oil from *Pleurogrammus monopterygius*, Pallas (n_D^{20} 1·4714, acid val. 19·0, sap. val. 183·3, I val. 92·1), yields 1·5% of unsaponifiable matter (cholesterol and oleyl alcohol) and mixed fatty acids among which palmitic, stearic, myristic, arachidic, clupanodonic, behenic, and cetoleic acids are identified. The probable presence of unsaturated

C_{24}- (nisinic, scoliodonic), C_{26}- (thynnic, sibic), and highly unsaturated C_{28}-acids is demonstrated. F. N. W.

Total fat content of developing salmon eggs. F. R. Hayes and D. M. Ross (Proc. Roy. Soc., 1936, **B**, **121**, 358—375).—The total fat of salmon eggs (embryo + yolk) and larvæ rises slightly until 3—4 weeks after hatching, when it rapidly falls. Of the embryo alone, the total fat rises rapidly at first, falls about 20% at hatching, and then increases to the end of embryonic life. Absorption and combustion of fat occur simultaneously. Close relationships exist between these and similar data for the chick embryo, and a morphological parallel can be drawn with an appropriate time scale. F. A. A.

Animal lipins. XI. Reineckate of the polydiaminophosphatide from spleen. XII. Determination of diaminophosphatide in organs and fluids. Application to stromata of red blood cells and serum. S. J. Thannhauser and P. Setz (J. Biol. Chem., 1936, **116**, 527—531; 533—541, cf. A., 1935, 703).—XI. The prep. of the polydiaminophosphatide (I) from bovine spleen, employing a chromatographic adsorption, is described. (I) forms a cryst. compound (II) with reinecke acid (III). (II) is considered to be the reineckate of a trimeric sphingomyelin. Monoaminophosphatides (IV) do not react with (III).

XII. Applications are given of the reineckate method to the separate determination of diaminophosphatide (V) and (IV) in blood stromata and sera. (V) represents 50—66%, (IV) 50—33%, of the total phospholipin from both sources. Other data relating to various clinical conditions are given. F. A. A.

Phospholipin fatty acids of muscle. R. H. Snider (J. Biol. Chem., 1936, **116**, 503—510).—The total fatty acid of phospholipin of muscle contains 73% of liquid and 27% of solid acids. This ratio, and the I val. of the unsaturated acids, vary little between the various muscles of different animals, and remain unaffected by exercise. F. A. A.

Phosphatides. XIII. Highly unsaturated fatty acids of the glycerophosphatides of various organs. E. Klenck and J. Dittmer (Z. physiol. Chem., 1936, **244**, 203—208; cf. A., 1935, 1265; Ault and Brown, *ibid.*, 233).—Highly unsaturated C_{22} acids together with considerably greater amounts of C_{20} acids occur in the glycerophosphatides (I) of the heart, spleen, and adrenals of cattle. Probably such acids occur regularly together also in (I) of all other organs. W. McC.

Sphingomyelin in Niemann-Pick disease. C. Tropp and B. Eckardt (Z. physiol. Chem., 1936, **243**, 38—42; cf. Klenk, A., 1935, 1265).—The liver and spleen from a person suffering from the disease (complicated with amaurotic idiocy) contained respectively 19 and 25% of sphingomyelin (I). The liver-(I) had $[\alpha]_D^{20}$ +5·58° in $CHCl_3$ + MeOH and the spleen-(I) $[\alpha]_D^{20}$ +5·86°. Hydrolysis of (I) with H_2SO_4 in MeOH gave lignoceric, palmitic, and stearic acid. W. McC.

Glycogen and water storage. E. M. Greisheimer and E. Goldsworthy (Proc. Soc. Exp. Biol. Med., 1936, **33**, 32—34).—In a large group of animals there is good correlation between glycogen and H_2O contents of the liver, but not between blood-sugar and either of these vals. P. G. M.

Unimolecular films of nerve-proteins. L. Fourt and F. O. Schmitt (J. Physical Chem., 1936, **40**, 989—996).—Surface pressure–area relations have been determined for nerve-protein fractions spread on aq. buffer solutions. Surface potentials have also been measured. A characteristic of all the films studied is a time lag in the establishment of the equilibrium pressure after changing the area, due to readjustment of a temporary unstable orientation of the mols. The results are discussed. F. L. U.

Enamel protein. P. Pincus (Nature, 1936, **138**, 970).—The protein in the enamel of human teeth appears to contain tyrosine but no S, although hitherto believed to be a keratin. The *X*-ray diagram (W. T. Astbury) differs from that given by some keratins. L. S. T.

Base-protein-acid compounds. M. H. Fischer and W. J. Suer (Arch. Path., 1935, **20**, 683—689; Chem. Zentr., 1936, i, 1433).—It is considered that the modifying action of salts and of H_2O on proteins is due to real chemical combination; the application of this view to the problem of living matter is discussed. H. N. R.

Centrifugal separation of "colloid" from living thyroid gland. J. F. McClendon (Proc. Soc. Exp. Biol. Med., 1935, **33**, 413—414).—Prolonged centrifuging (160,000—200,000*g*) causes separation of thyroglobulin from the living thyroid gland (man, pig, rabbit). W. McC.

Potentiometric study of flavins.—See A., I, 85.

Quantitative theory of membrane permeability. T. Teorell (Proc. Soc. Exp. Biol. med., 1935, **33**, 282—285).—The theory of permeability of membranes may be developed from the theory of electrolytes by regarding the negative membrane as equiv. to a group of negative immobile ions distributed throughout its vol. Application of equations for the diffusion of electrolytes leads to vals. for the total e.m.f. across a membrane separating NaCl solutions of different concns. which are in general agreement with experimental results. W. O. K.

Nature and permeability of grasshopper egg membranes. II. Chemical composition of membranes. T. L. Jahn (Proc. Soc. Exp. Biol. Med., 1936, **33**, 159—163).—An investigation of the chitin of the chorion and cuticle of grasshopper egg membranes. P. G. M.

Structure and absorption relationships of the chromosomes of the salivary glands of *Drosophila virilis*. H. von Euler, H. Hellström, and K. Brandt (Arkiv Kemi, Min., Geol., 1936, **12**, **A**, No. 6, 16 pp.; cf. A., 1935, 1266).—The stainable constituent of chromosomes may be identical with the substance which absorbs ultra-violet light after suitable fixation with a moderately acidic solution [alum, picric acid (I), C_5H_5N]. The absorbing substance is dissolved out by grinding the glands with

H_2O, Ringer's solution, glycerol, dil. aq. C_5H_5N, and strong acids. The stainable substance adsorbs (I), shows reducing properties after hydrolysis, and adsorbs I after fixation in acids. E. A. H. R.

Nature, changes in size, and reversibility of chondriosomes. A. Russo (Atti R. Accad. Lincei, 1936, [vi], **23**, 543—545).—The lipin–protein character and physico-chemical processes of chondriosomes and other cellular elements are discussed. F. O. H.

Evidence for linear units within protoplasm. H. H. Pfeiffer (Nature, 1936, **138**, 1054).—A discussion. L. S. T.

Bee poison. II. Magnesium content of bee poison. G. Hahn and L. Leditschke (Ber., 1936, **69**, [*B*], 2764—2765; cf. this vol., 9).—The crystals formed when the crude or purified poison is treated with NH_3 are identified as $MgNH_4PO_4$. Traces of other biologically significant metals are not observed. H. W.

Micro-determination of lactose in milk. A. Kern (Biochem. Z., 1936, **288**, 375—377).—The milk (0·1 c.c.) is coagulated by $Cd(OH)_2$ (from $CdSO_4$ and NaOH), filtered, and lactose determined in the filtrate by heating with $K_3Fe(CN)_6$ and iodometric titration of $Fe(CN)_6''''$ formed. F. O. H.

Physical chemistry and serological properties of spinal fluid. N. Bernstein (Arch. Phys. biol. Chim.-Phys. Corps, 1935, **12**, 155—179; Chem. Zentr., 1936, i, 1249).—Neutralisation and buffer curves together with cataphoretic and hæmolytic measurements show no characteristic differences between healthy and diseased cases. A. G. P.

Diastase in rabbit saliva. I. M. Thomas (Nature, 1936, **138**, 1015—1016).—Rabbit saliva rapidly hydrolyses broken starch grains. The low diastatic activity observed by Schwartz and Rasp (Fermentforsch., 1926, **9**, 50) is probably due to adsorption of the enzyme by the cotton-wool used in the collection of the saliva. L. S. T.

Formation of bile-pigment. H. T. Schreus and C. Carrié (Med. Welt, 1935, **9**, 1135—1137; Chem. Zentr., 1936, i, 1453—1454).—Protoporphyrin (I) is produced by the action of liver-pulp on hæmoglobin and hæmatin (optimum p_H 7·0—5·0). At p_H 7·8 formation of (I) declines but pigment appears as a decomp. product. Catalase inhibits pigment formation. The mechanism of these changes is examined. A. G. P.

Presence of antibody in bile. J. A. Sterling (Proc. Soc. Exp. Biol. Med., 1935, **33**, 251—253).—Dogs immunised with a multivalent vaccine contained antibodies in the hepatic and gall-bladder bile in concns. < in serum. W. O. K.

Comparison of methods for determination of bile acids in bile. Proportion between the acids. B. Josephson and G. Jungner (Biochem. J., 1936, **30**, 1953—1959).—The colorimetric method, best used in Josephson's modification (A., 1935, 1000), determines only cholic acid and its conjugates including scymnol. Of the gasometric methods only that of Jenke and Steinberg (A., 1930, 1462) gives satisfactory results. After complete hydrolysis the polarimetric method gives trustworthy results but frequently the solutions are too highly coloured to be used. In biles having taurocholic acid (I) as the only S constituent combined S and total N determinations permit distinction between (I) and glycocholic acid. W. McC.

Nitrogen content of the bile. H. G. Aronsohn and E. Andrews (Proc. Soc. Exp. Biol. Med., 1936, **33**, 85—87).—Total N of dog bile averages 0·34%. No correlation exists between total N and various diseased states. P. G. M.

Oxidation product of urobilin.—See A., II, 36.

Reactions of pregnancy urine. P. E. Simola and R. Närvänen (Suomen Kem., 1936, **9**, B, 29—30).—Urine treated with a 5% solution of I in EtOH, until the colour of I just persists, when boiled affords a reddish colour sol. in C_5H_{11}·OH. Positive results are obtained from 80% of pregnancy and 19% of normal urines. Histidine is not responsible for the colour. J. L. D.

Relation between excretion of urea and creatinine and rate of urine production in the dog. J. A. Shannon (Proc. Soc. Exp. Biol. Med., 1935, **33**, 474—476).—The rate of excretion of urea increases as the rate of production of urine increases, no limiting val. being attained. The rate of excretion of creatinine is scarcely affected by that of urine production. W. McC.

Significance of C_3 substances in urine. A. P. Suñer (Compt. rend. Soc. Biol., 1936, **123**, 859—862).—C_3 substances are connected with carbohydrate metabolism, but no parallelism was observed between their secretion and glycosuria or ketonuria. H. G. R.

Composition of glomerular urine. XIV. Glomerular excretion of inulin in frogs and necturi. J. P. Hendrix, B. B. Westfall, and A. N. Richards (J. Biol. Chem., 1936, **116**, 735—747).—A method for the micro-determination of inulin (I) based on the determination of sugars after acid hydrolysis (cf. Walker *et al.*, A., 1933, 250), is described. Intravenously injected (I) is excreted in the glomerular urine of frogs and necturi in a concn. equal to that in the plasma. The glomerular process is probably one of filtration only. As (I) has the largest mol. of all normal urinary constituents, its size gives an approx. measure of the pore-size of the glomerular membrane. E. A. H. R.

Colorimetric determination of p_H.—See A., I, 96.

Deterioration of materials due to [human] sweat. H. Priess and O. Kauke (Chem.-Ztg., 1936, **60**, 1017).—The principal agent bringing about deterioration of clothing by sweat is NH_3 produced by the bacterial decomp. of urea, of which sweat contains 0·1—0·5%. A. B. M.

Addison's disease (functional renal failure). C. Jimenez-Diaz (Lancet, 1936, **231**, 1135—1139).—An address. L. S. T.

Effect of adrenaline on blood-sugar and -lactic acid in Addison's disease and in adrenalectomised dogs. I. Anderson (Proc. Soc. Exp. Biol. Med., 1935, **33**, 349—356).—Subcutaneous injection of adrenaline (I) increases blood-sugar (II) in disease as in health, the curve having the same contour in both cases. The blood-lactate (III) curve remains high in disease longer than in health possibly because the liver is slow in converting (III) into glycogen. The (II) and (III) curves following a single intravenous injection of (I) into adrenalectomised dogs are lower and tend to remain elevated longer than in the same dogs before removal of the second adrenal gland. W. McC.

Agranulocytosis and amidopyrine. S. C. Dyke (Brit. Med. J., 1936, No. 3957, 911—914).—Ingestion of amidopyrine or related compounds containing the C_6H_6 and substituted pyrazolone rings induces agranulocytosis in sensitive subjects who have passed the change of life. Susceptibility is associated with changes in the nature or balance of sex hormones. A. G. P.

Effect of iron on hæmoglobin regeneration in gastrectomised dogs. C. A. Dragstedt, J. D. Bradley, and F. B. Mead (Proc. Soc. Exp. Biol. Med., 1936, **33**, 58—60).—Both the spontaneous and induced anæmia of gastrectomised dogs is microcytic, and responds to Fe but not to liver therapy. P. G. M.

Glutathione content of blood in nutritional anæmia. M. O. Schultze and C. A. Elvehjem (J. Biol. Chem., 1936, **116**, 711—716).—In nutritional anæmia of rats, the reduced glutathione (I) content of the red cells falls to low levels. On feeding both Fe and Cu there is a rapid rise of the reduced (I) content to normal vals. Normally 90—100% of the total (I) is in the reduced form but <50% in nutritional anæmia. In nutritional anæmia of pigs both total and reduced (I) contents of the red cells increase. E. A. H. R.

Age and rate of decrease of red blood-cells before and after liver treatment of pernicious anæmia. L. S. Ornstein and J. F. Schouten (Proc. K. Akad. Wetensch. Amsterdam, 1936, **39**, 1079—1088).—A relation is established between the change in serum-bilirubin in pernicious anæmia during liver treatment and laws governing the death rate of red cells. A. G. P.

Biological evaluation of anti-anæmia liver preparations. K. Zipf and P. Gottlebe (Arch. exp. Path. Pharm., 1936, **184**, 71—73).—By intravenous injection into rabbits of saponin along with colloidal Ag (collargol) or Fe (electroferrol) an anæmia resembling pernicious anæmia in man is established and remains const. for 1 month. Animals so treated can be used for assay of liver preps. P. W. C.

Morphology and chemistry of blood of cattle in health and during anaplasmosis. C. W. Rees and M. W. Hale (J. Agric. Res., 1936, **53**, 477—492).—During the incubation period of infected bulls blood changes were small. The clinical stage is associated with a decrease in red and an increase in white cells, lowered hæmoglobin and O_2-capacity in blood. Sugar, P, serum-protein, Ca, and urea were unaffected. Serum-bilirubin increased. A. G. P.

Ionised blood-calcium in patients with renal calculi. H. Pollack and M. Reiner (Proc. Soc. Exp. Biol. Med., 1935, **33**, 432—433).—In 24 cases of renal calculi there was no accompanying increase in the $Ca^{\cdot\cdot}$ content of the blood. M. McC.

Cancer research in Great Britain. Anon. (Nature, 1936, **138**, 999—1000). L. S. T.

Cancer as a metabolism problem. W. Brandt (Chem.-Ztg., 1936, **60**, 1033—1035).—A survey.

Disposition towards cancer : its diagnosis and prevention. G. Klein (Arch. Klin. Chirurg., 1935, **183**, 194—202; Chem. Zentr., 1936, i, 1241—1242).—Use is made of the substance present in serum which effects lysis of tumour cells. A. G. P.

Chemistry of carcinoma. III. A. von Christiani (Z. Krebsforsch., 1935, **42**, 317—323; Chem. Zentr., 1936, i, 1637; cf. A., 1936, 1538).—The "carcinoma intestinal acid" (Freund and Kaminer) is identified as a mixture of palmitic and stearic acids. In carcinoma cases sera contain less cholesteryl ester-splitting enzymes than normal. The esters protect cancer cells from cytolysis. A. G. P.

Influence of pregnancy hormone on the development of epithelial tumours. F. Savignoni (Rass. Clin. Terap., **32**, 349—363; Chem. Zentr., 1936, i, 1445).—Pregnancy urine contains a hormone which inhibits the growth of Herlich adenocarcinoma. A. G. P.

Non-bacterial cholecystitis. Mechanism of acidification of bile in the gall bladder. H. G. Aronsohn and E. Andrews (Proc. Soc. Exp. Biol. Med., 1936, **33**, 89—91).—The marked rise in P content and the increased concn. of protein > balance the loss of Cl′ and account for the acidification of gall-bladder bile; increase of bile acid concn. also contributes slightly to this effect. P. G. M.

Sexual function in relation to water economy and especially to diabetes insipidus. L. Beltrametti (Endokrinol., 1935, **16**, 241—256; Chem. Zentr., 1936, i, 1445).—The antipolyuretic action of folliculin is examined. A. G. P.

Plasma magnesium and potassium in epilepsy. A. D. Hirschfelder and V. G. Haury (Proc. Soc. Exp. Biol. Med., 1936, **33**, 40—42).—Plasma-Mg, -K, and -Ca were normal in epileptics who were not in convulsions. Oral administration of $MgCl_2$ did not lessen nor did that of KCl increase the frequency of attacks. P. G. M.

Free and combined purines of the blood in gout. F. Coste, A. Grigaut, and A. Mande (Compt. rend. Soc. Biol., 1936, **123**, 1078—1081).—Total blood-purine is increased in gout, but little variation is observed in the ratio of free to combined purine. H. G. R.

Hæmophilia. W. A. Timperley, A. E. Naish, and G. A. Clark (Lancet, 1936, **231**, 1142—1149).—A substance extracted from egg-white incubated at 37° for several days in presence of KBr reduces the clotting time of blood and controls hæmorrhage in

hæmophilics. A derivative of mucic acid has similar properties. L. S. T.

Bile acids in icterus produced by tolylenediamine. J. M. McGowan, J. L. Bollman, and F. C. Mann (J. Pharm. Exp. Ther., 1936, **58**, 305—311).—Jaundice produced by tolylenediamine in dogs resembles obstructive jaundice in the accompanying decrease of bilirubin and bile acids (I) in the bile and their appearance in the blood and urine. Intense hyperbilirubinæmia occurs. The continued formation of (I) shows that this function of the liver is unimpaired. E. M. W.

Alterations in serum-proteins as an index of liver failure. E. F. Foley, R. W. Keeton, A. B. Kendrick, and D. Darling (Proc. Soc. Exp. Biol. Med., 1935, **33**, 430—431).—In grave liver injury the albumin (I) content of the blood-serum is diminished and the globulin (II) content increased, the (I) : (II) ratio being reversed. W. McC.

Clinical significance of cholesterol distribution in plasma in hepatic and biliary diseases. E. Z. Epstein and E. B. Greenspan (Arch. Int. Med., 1936, **58**, 860—890).—Data for the levels of plasma-cholesterol and -cholesteryl ester in hepatic and biliary diseases are tabulated and their significance in diagnosis is discussed. F. O. H.

Therapeutics of malaria. A. R. Filko (Rev. Syniatrica, 1936, **29**, 215—249).—A review and discussion.

[Chemistry of] antimalarials. I, II.—See A., II, 33.

[Blood] complement titre in acute nephritis. C. E. Kellett (Lancet, 1936, **231**, 1262—1265).—A method for the determination of blood complement is described. In acute glomerulonephritis the blood complement is < normal. L. S. T.

Paget's disease. Relative constancy of serum phosphatase over periods up to two years. A. B. Gutman and E. B. Gutman (Proc. Soc. Exp. Biol. Med., 1936, **33**, 150—153).—The increased serum phosphatase in Paget's disease is not affected by radiotherapy, irrespective of any benefit resulting from treatment. P. G. M.

Hormonal diagnosis of pregnancy in the mare. J. Richter and K. Gehring (Berlin. tierärztl. Woch., 1935, **51**, 829—832; Chem. Zentr., 1936, i, 1648—1649). H. J. E.

Mandelic acid in the treatment of pyelitis in childhood. G. H. Newns and R. Wilson (Lancet, 1936, **231**, 1087—1089).—The acid appears to be an effective remedy for *B. coli* pyelitis in children. L. S. T.

Bee venom in rheumatic disorders. F. S. Mackenna (Lancet, 1936, **231**, 1212—1213).—"Apicur," a bee venom prep., has a beneficial effect. L. S. T.

Protein metabolism and oxidative processes in experimental scurvy. V. Specific protein metabolism of muscle of scorbutic guinea-pigs. L. D. Kashevnik (Biochem. Z., 1936, **288**, 409—413; cf. A., 1936, 369).—Scurvy in guinea-pigs is accompanied by a diminution in the contents of N and protein constituents of skeletal and cardiac muscle and an increase in the H_2O-sol. N fraction. The proteins of cardiac muscle appear to be more stable than those of skeletal muscle. F. O. H.

Epidemiological aspects of silicosis and tuberculosis. A. S. Pope and D. Zacks (Amer. Rev. Tuberc., 1935, **32**, 229—242).—The incidence of the diseases among granite and foundry workers is examined. Ch. Abs. (*p*)

Measurement of reagin in non-syphilitic sera. C. W. Barnett, R. B. Jones, and G. V. Kulchar (Proc. Soc. Exp. Biol. Med., 1935, **33**, 214—218).—Non-syphilitic sera regularly contain small quantities of reagin (the substance assumed to be responsible for a positive Wassermann reaction) as tested for by a modified application of the Kline reaction. W. O. K.

Retarding action of subcutaneous injections of ethyl laurate, stearate, or palmitate on experimental tuberculosis in guinea-pigs. L. Nègre, A. Berthelot, and J. Bretey (Compt. rend. Soc. Biol., 1936, **123**, 864—865). H. G. R.

Alkali poisoning in the treatment of gastric ulcer. C. L. Cope (Brit. Med. J., 1936, No. 3957, 914—917).—Alkali poisoning resulting from ingestion of alkalis in treatment of gastric ulcers is associated with casts and albumin in urine, high blood-urea and -p_H, increased N retention involving total non-protein-N of blood and plasma-creatinine, increased plasma-PO_4''', -Cl', and alkali reserve. A. G. P.

Mandelic acid in the treatment of urinary infections. M. L. Rosenheim (Lancet, 1936, **231**, 1083–1087). L. S. T.

Oxygen consumption of mayfly nymphs in relation to available oxygen. H. M. Fox, C. A. Wingfield, and B. G. Simmonds (Nature, 1936, **138**, 1015—1016).—Wide variations in O_2 consumption in relation to O_2 available in the H_2O are shown by different species. In some, O_2 intake falls immediately the O_2 in the environment falls, in others it does not fall until available O_2 has reached a low val. When O_2 in excess of the normal amount is available, *Baëtis* sp. increases its consumption by 50%, whilst other species make little or no response. L. S. T.

Significance of fumaric acid for the respiration of animal tissues. III. (A) Introduction, review, methods. A. Szent-Györgyi. **(B) Quantitative investigation of catalysis by fumaric acid.** F. B. Straub. **(C) Interaction of oxalacetic acid, hydrazine, and nitrous acid.** V. Bruckner. **(D) Oxidation of fumaric acid and reduction of oxalacetic acid by muscle pulp.** I. Banga. **(E) Reduction of oxalacetic acid in embryonal tissue.** A. Blazsó. **(F) Decarboxylation of oxalacetic acid by muscle.** F. B. Straub. **(G) Hydrogen donator of oxalacetic acid reduction in muscle.** K. Laki. **(H) Catalysis by fumaric acid and behaviour of pyruvic acid in liver.** E. Annau. **(I) Function of succinodehydrogenase.** K. Laki (Z. physiol. Chem., 1936, **244**, 105—116, 117—127, 127—130, 130—137, 138—139, 140—141, 142—144, 145—149, 149—152).—(A) Trustworthy results are obtainable only when quant.

micro-methods are employed and time intervals $\gtrsim$10 min. are considered. It is suggested that in fermentation $AcCO_2H$, and in respiration oxalacetic acid (I), are the H acceptors but that otherwise the processes are identical. The enzymes of fermentation and respiration seem to act indirectly, not attacking carbohydrate but acting on malic (II) and lactic acid (III). Within certain limits the amount of (I) which disappears is a measure of the amount reduced and hence of the extent of respiration.

(B) The $AcCO_2H$ of 1 ml. of suspension (deproteinised with Na tungstate $+H_2SO_4$) of pigeon's breast muscle (containing $\gtrsim$0·5 mg. of $AcCO_2H$) is determined by adding 1 ml. of aq. KOH (100 g. in 60 ml. of H_2O) and 0·5 ml of solution of 2 vols. of *o*-$OH{\cdot}C_6H_4{\cdot}CHO$ in 100 ml. of 96% EtOH, maintaining for 10 min. at 37°, cooling to room temp., removing K_2SO_4 by centrifuging, and measuring with a photometer the depth of colour (due to the production of *o*-hydroxybenzylidenepyruvic acid) produced in $\gtrsim$1 hr. (I) does not interfere but if it is present the determination must be made as soon as possible since (I) readily changes into $AcCO_2H$. About 20% of the $AcCO_2H$ remains bound to the protein and allowance is made for this. The average error is 10%. The spontaneous decarboxylation of (I) is a unimol. reaction with max. at p_H 2—3. No decarboxylation occurs in strongly alkaline solutions. For the determination of (I) in the muscle 1 ml. of the deproteinised filtrate [containing $\gtrsim$2 mg. of (I)] is treated with 1·4 ml. of a solution of 3·5 g. N_2H_4 + HCl in 30 ml. H_2O + 100 ml. of 96% EtOH. The mixture is maintained at 37° for 15 min., cooled in ice for 3 min., and treated with 0·1 ml. of saturated aq. $NaNO_2$. After 5 min. 1 ml. of aq. KOH (100 g. in 60 ml. of H_2O) is added, K_2SO_4 is removed by centrifuging, and the depth of colour produced by the yellow K salt of *4-nitrosopyrazolone-3-carboxylic acid* (IV) is measured with a photometer. Part of the (I) remains bound to the protein and a correction must be applied. *l*-Malic acid (V) is determined in 15—20 ml. of the deproteinised filtrate by neutralising with Na_2CO_3 (p_H 3—8), adding about 0·6 g. of $UO_2(OAc)_2$ for each 10 ml. of solution, separating $UO_2(HPO_4)_2$ by filtration, and determining $[\alpha]_D$, which is increased to about −450°. A correction is applied for (V) bound to protein. The error is ±10%. (III) in the concns. found in muscle does not interfere. Procedures and apparatus for the micro-determination of CO_2 and R.Q. are described [*e.g.*, for catalytic decarboxylation of (I) with NH_2Ph by Ostern's method (A., 1933, 964)].

(C) Hydroxyfumaric acid (VI) [which changes into (I) in H_2O] with N_2H_4 + HCl gives pyrazolone-3-carboxylic acid (VII) (in absence of HCl the yield is low since spontaneous decarboxylation occurs) and (VII) with $NaNO_2$ gives 4-oximinopyrazolone-3-carboxylic acid. The hydrazone of (I) cannot be isolated.

(D) In 4 ml. of muscle suspension containing added fumaric acid (VIII) the max. amount of (I) is obtained by incubation with 20 mg. of N_2H_4 + HCl. Activation of (VIII) is inhibited by >40 mg. of N_2H_4. No (I) is obtained by incubation with (VIII) alone and little by incubation with (VIII) + AsO_3'''. Under aërobic and anaërobic conditions about 80% of (I) which disappears is recovered as (VIII) + (II). Fixation of (I) by N_2H_4 + HCl is max. in about 10 min. and reduction of (I) is most intense during the first 5 min. Rat's muscle reduces (I) to the same extent as does pigeon's muscle, but rat's and rabbit's liver have less reducing power and tumour tissues little or none.

(E) The respiration of the muscle of young ($\gtrsim$28 days old) and unborn rats is about 33% < that of the muscle of adult rats. (I) is not attacked by the embryonal muscle or by muscle from rats < 14 days old and added (VIII) does not increase the O_2 uptake in muscle < 10 days old. Succinic acid (IX) stimulates respiration of the muscle equally at all ages. Added $AcCO_2Na$ is slightly attacked by the muscle at all ages, the amount which disappears not being increased by separate addition of NaF and hexose diphosphate, but when these are added together after the 14th day the amount is greatly increased. The disappearance of added (I) after the 14th day and that of added $AcCO_2H$ proceed in parallel, indicating that the system which activates the hexose (or triose produced from it) by dehydrogenation is responsible for both processes. At all ages added glutamic acid causes rapid disappearance of (I).

(F) (II) added to the muscle is not attacked and can be quantitatively recovered after 30 min. At the same time (II) increases the O_2 uptake by 100%. No (I) or $AcCO_2H$ is produced. The rate of spontaneous decarboxylation of (I) is doubled by addition of washed boiled muscle pulp. In 4 ml. of muscle suspension 10 min. after addition of 20 mg. of (I), 15·5 mg. of (I), 1·9 mg. of $AcCO_2H$, and 4·7 mg. of (VIII) + (II) are found. Hence decarboxylation of (I) proceeds so slowly that the process plays no significant part in intermediary metabolism.

(G) $AcCO_2H$ added to suspension of muscle rapidly disappears, but the disappearance is accompanied by rapid reduction of added (I), (VIII) + (II) being produced in approx. equiv. amounts. When AsO_3''' is present reduction of (I) is much less and the amount of (VIII) + $AcCO_2H$ is at first equiv. to the amount of (I) which disappears. Hence $AcCO_2H$ is not produced by decarboxylation of (I). Later the amount of $AcCO_2H$ produced is > equiv. to the (I) reduced and the (VIII) + (II) produced since $AcCO_2H$ is produced by the muscle. In muscle extract similar results are obtained.

(H) The O_2 uptake of minced liver is usually increased by addition of (VIII) and $AcCO_2H$ and always increased by that of (VIII) + $AcCO_2H$. When (VIII) is present 1 O, when it is absent < 1 O, is consumed for each mol. of $AcCO_2H$ which disappears. When, owing to lack of (VIII), oxidation of $AcCO_2H$ is incomplete $COMe_2$ is produced but not if (VIII) is present. The amount of $AcCO_2H$ which disappears is not affected by presence or absence of (VIII). The O_2 consumption is affected by added alanine in the same way as by added $AcCO_2H$.

(I) Succinodehydrogenase (from horse flesh) when free from fumarase oxidises (IX) to (VIII) and activates (VIII), which serves as H donator, but not (II).

W. McC.

Effect of fumarate on respiration. F. J. Stare and C. A. Baumann (Proc. Roy. Soc., 1936, **B**, **121**, 338—357).—Manometric measurements show that fumarate (I) and other 4-C acids increase the O_2 uptake of pigeon breast muscle, and that (I) removes inhibition by malonate. Tissue extract also increases the O_2 uptake, and with (I), restores the activity of ground muscle to normal. The action of fumarate appears to be primarily catalytic. F. A. A.

Effect of fumarate on the respiration of liver and kidney. F. J. Stare (Biochem. J., 1936, **30**, 2257—2261; cf. this vol., 60).—The respiration of rabbit's liver and kidney is increased by addition of fumarate (I) and inhibited by that of malonate. Added (I) is converted into oxalacetate (II) and added (II) disappears, being converted into an equilibrium mixture of (I) and malic acid. Szent-Györgyi's theory of (I) catalysis of respiration in muscle thus applies to liver and kidney also. W. McC.

Metabolic mechanism and nutrition in relation to the systematic classification of man as herbivorous, carnivorous, or omnivorous. A. Bickel and L. Gerez (Chem.-Ztg., 1936, **60**, 996—997).—A lecture. A. G. P.

Effect of feeding goats' milk to rats. W. Ochse (Z. ges. exp. Med., 1935, **97**, 252—264; Chem. Zentr., 1936, i, 1250).—Goat milk produced in rats disturbances of growth processes and a modified blood picture, frequently with hypochrome anæmia. A. G. P.

Growth factor required by chicks. Essential nature of arginine. A. Arnold, O. L. Kline, C. A. Elvehjem, and E. B. Hart (J. Biol. Chem., 1936, **116**, 699—709; cf. Kline *et al.*, A., 1934, 1417).—The growth-promoting factor (I) in H_2O-extracted liver residue, required by growing chicks, becomes H_2O-sol. on alkaline hydrolysis. (I) is arginine (II) as there are similar responses in growth when (I) is replaced by proteins rich in (II) and by (II) salts. (II) is therefore an essential NH_2-acid for growing chicks; after 6 weeks the growth-promoting effect decreases. E. A. H. R.

Bioassay of protein supplements fed to chicks. S. F. Cook and K. G. Scott (Proc. Soc. Exp. Biol. Med., 1936, **33**, 167—170).—When fish meal (10—20%) replaced casein or skim milk in an otherwise adequate diet the chicks developed anæmia, hæmorrhages, and a prolonged blood-clotting time. P. G. M.

Relation of glycogen, fat, and protein to water storage in liver. A. Kaplan and I. L. Chaikoff (J. Biol. Chem., 1936, **116**, 663—683).—Determinations of glycogen (I), fat (II), protein, and H_2O in the livers of depancreatised and/or hypophysectomised, phloridzinised, thyroid-fed, and normal dogs showed that deposition of (I) and (II) in the liver is not accompanied by measurable amounts of H_2O. Large amounts of (II) in liver do not interfere with storage of (I). The H_2O content of the liver ∝ a definite protein-containing fraction. J. N. A.

Digestibility of kao-liang. C. F. Wang (Chinese J. Physiol., 1936, **10**, 645—650).—The coeffs. of digestibility of protein, fat, and carbohydrate in a diet consisting mainly of kao-liang, tested on four Chinese accustomed to such a diet, are 83·9, 92·3, and 99·5%, respectively. F. A. A.

Determination of apparent digestibility of green and cured grass by modified procedures. J. C. Knott, H. K. Murer, and R. E. Hodgson (J Agric. Res., 1936, **53**, 553—556).—The rapid method of Gallup and Kuhlmann (A., 1931, 868), using SiO_2 in food and fæces as an index of digestibility, was difficult of application owing to contamination with dust or with soil. A modification of Bergeim's method (A., 1926, 1170), using Fe as an index, gave results differing significantly from those of standard practice. The passage of ingested Fe through the digestive system of ruminants is not uniform. A. G. P.

Biological values of mixed cereal and legume proteins. T. H. Lan (Chinese J. Physiol., 1936, **10**, 637—643).—The proteins of various cereal–legume mixtures, tested on rats at 10% level, give biological vals. of 73—77. A mixture of corn, millet, and soya bean gives the val. 73 (cf. Adolph and Cheng, A., 1935, 1405). F. A. A.

Reproductive capacity of female rats as affected by kinds of carbohydrates in the ration. C. H. Whitnah and R. Bogart (J. Agric. Res., 1936, **53**, 527—532).—A ration containing sucrose was inadequate for normal reproduction even when replaced in adult life by a normal ration. Ovarian abnormalities in these animals indicate pituitary disturbance. Rations containing lactose and starch permitted normal reproduction. A. G. P.

Effect of added purines on uric acid production by isolated tissues of the rat. H. Borsook and C. E. P. Jeffreys (Proc. Soc. Exp. Biol. Med., 1936, **33**, 1—2).—The intestinal mucosa and liver account for most of the uric acid production from added purines. P. G. M.

Urinary creatine, sulphur, phosphorus, and chlorine during fasting and alimentation. (A) V. Zagami. (B) V. Zagami and V. Capraro. (C) V. Zagami (Atti R. Accad. Lincei, 1936, [vi], **23**, 629—635, 635—640, 700—706).—The levels in rats during periods of fasting and of feeding on various diets are tabulated and discussed. F. O. H.

Inulin and creatinine clearances in dogs. Late effects of uranium poisoning. A. N. Richards, B. B. Westfall, and P. A. Bott (J. Biol. Chem., 1936, **116**, 749—755).—In normal dogs, injected inulm and creatinine are excreted solely (by glomerular filtration) at the same rate with respect to their concns. in plasma. E. A. H. R.

(A) Metabolism of bromobenzene in growing dogs and mice maintained on adequate diets. (B) Synthesis of *p*-bromophenylmercapturic acid by fasting growing dogs. J. A. Stekol (Proc. Soc. Exp. Biol. Med., 1936, **33**, 115—119, 119—121).—(A) Growing dogs and mice can synthesise *p*-bromophenylmercapturic acid (I) from PhBr. (I) is present in urine as long as the neutral S remains > normal; 120—130 mg. can be isolated per g. of PhBr fed to Dalmatian pups.

(B) Fasting growing dogs can synthesise (I) and are capable of supplying cystine for detoxication purposes at the expense of tissue. P. G. M.

Metabolism of benzene, anthracene, and phenanthrene in adult and growing dogs. J. A. Stekol (Proc. Soc. Exp. Biol. Med., 1936, **33**, 170—171).—All three hydrocarbons produce an increase in urinary glycuronates. C_6H_6 and phenathrene increase the neutral S of the urine, whilst C_6H_6 and anthracene promote ethereal sulphate formation. P. G. M.

Fat metabolism. S. Skraup (Chem.-Ztg., 1937, **61**, 65—67).—A review.

White rats as experimental animals in the study of the soft-fat problem. H. E. Robinson, R. E. Gray, and R. C. Newton (Food Res., 1936, **1**, 413—418).—Rats show body-fat formation parallel to that of hogs when fed on similar diets. Saturated fats tend to offset the effects of soya-bean and peanut oils on the body fat of rats. P. G. M.

Mechanism of carbohydrate oxidation. F. Dickens (Nature, 1936, **138**, 1057).—Evidence suggesting that the first stage in the biological oxidation of carbohydrate is its conversion to glucose-6-phosphoric acid (or Robison ester), which is oxidised to 6-phosphogluconic acid (I), is advanced. Dehydrogenation by a sp. dehydrogenase co-enzyme system yields 6-phosphoketogluconic acid, which is then decarboxylated by different routes in animal tissues and in yeast. Phosphohexonic dehydrogenase, isolated from yeast, is active only after addition of Warburg oxidation co-enzyme and yellow enzyme, when the O_2 uptake with (I) at 37·5° is theoretical for dehydrogenation to ketogluconic acid. Indophenol oxidase and cytochrome probably take part in biological oxidation of carbohydrate by this system. L. S. T.

Ketosis. VIII. Oxidation of ethyl esters of fatty acids. H. J. Deuel, jun., L. F. Hallman, J. S. Butts, and S. Murray (J. Biol. Chem., 1936, **116**, 621—639; cf. A., 1936, 235).—Administration of Et acetoacetate, butyrate, and hexoate to fasting rats caused a uniform ketonuria which was somewhat < that produced by the Na salts. More than twice the ketonuria was observed after feeding Et octoate, decoate, laurate, and myristate, and an even greater amount was found after feeding Et palmitate and stearate (both in oil) and Et oleate without oil. With the last 3 acids, decomp. into three parts capable of producing "acetone" bodies probably occurs, whilst the lower acids break up into only two parts. No appreciable ketonuria followed administration of Et propionate, valerate, heptoate, nonoate, and undecoate. Hexoic and butyric acids as well as the odd-no. C acids probably break down chiefly by β-oxidation, whilst the even-no. C acids. (8—14 C) are degraded by δ- and ζ-oxidation. $COMe_2$ is the only important ketone found after administration of higher even-no. C acids. J. N. A.

Ketosis in primates. W. Goldfarb (J. Biol. Chem., 1936, **116**, 787—791).—The calc. amounts of $COMe_2$ that should be excreted by phloridzinised monkeys, assuming a ketogenic–antiketogenic ratio of 2 : 1, agree with the amounts recovered in the urine. Complete oxidation of ketogenic substances therefore probably requires the simultaneous oxidation of a definite proportion of antiketogenic foodstuffs. E. A. H. R.

Ketogenesis–antiketogenesis. V. Metabolism of ketones. N. L. Edson and L. F. Leloir (Biochem. J., 1936, **30**, 2319—2332).—The aërobic and anaërobic metabolism of ketones in rat, pigeon, and guinea-pig tissues is investigated by means of the slice technique. $AcCO_2Na$ and fructose accelerate the anaërobic disappearance of $CH_2Ac{\cdot}CO_2H$ (I) in liver but have no marked influence in other tissues except pigeon's kidney. Malonate (II) and hydroxymalonate (III) do not inhibit oxidation of $OH{\cdot}CHMe{\cdot}CH_2{\cdot}CO_2H$ (IV) to (I) but (II) prevents aërobic breakdown of (IV). Since (II) also acts as a sp. inhibitor of succinic dehydrogenase, aërobic metabolism of ketones is probably linked with succinic acid oxidation. (III), mesoxalate, tartrate, C_2O_4'', and NH_3 cause little depression of respiration and only slightly inhibit the disappearance of (I). P. W. C.

Inhibition of lactic acid formation in the cell by oxygen. A. Hahn, H. Niemer, and H. Heiting (Z. Biol., 1936, **97**, 578—581).—A prep. of the substance present in muscle, which catalyses the O_2 inhibition of lactic acid formation (Hahn and Niemer, A., 1936, 1017), is obtained by deproteinisation of a PO_4''' extract of muscle with $COMe_2$ followed by pptn. with $Ba(OAc)_2$. E. A. H. R.

Non-specificity of the chloride-impoverishing mechanism of small intestine. R. C. Ingraham (Proc. Soc. Exp. Biol. Med., 1935, **33**, 453—455).—In dogs in which the [Br'] in the blood-plasma has been increased by administration of NaBr, Cl' and Br' placed in an intestinal loop in concn. < in the plasma move from the intestine into the blood. W. McC.

Toxic action and excretion of iodide. Principle of Le Chatelier. O. Eichler (Arch. exp. Path. Pharm., 1936, **184**, 82—84).—Frogs were injected each with 10·7 c.c. of 2*M*-NaI and after varying lengths of time were killed and analysed. I' appeared initially to be absorbed by muscle and later slowly eliminated. Various explanations of the variation in I' content of blood, urine, and muscle are examined. P. W. C.

Water balance. I. Excessive oxygen usage response of dehydrated animals to water and electrolytes. II. Anoxæmic factor in water intoxication. H. A. Davis (Proc. Soc. Exp. Biol. Med., 1935, **33**, 242—244, 245—246).—I. The rise in O_2 consumption in dogs under Na barbital anæsthesia following the administration of large vols. of 0·9% aq. NaCl is greater and more prolonged in animals suffering from anhydræmia than in normals.

II. Changes in blood-hæmoglobin, blood-O_2, and O_2 consumption rate following administration to dogs of excessive quantities of 0·9% aq. NaCl or 5% aq. glucose suggest that symptoms of H_2O intoxication are partly the result of anoxæmia. W. O. K.

Physiological potency of dilute traces. (Sir) J. Larmor (Nature, 1936, **138**, 929—930).—A discussion. L. S. T.

Oxidative catalysis in the living cell. P. Joyet-Lavergne (Compt. rend., 1936, **203**, 1020—1022).—Catalysis of intracellular oxidation–reduction occurs in the chondrioma and is connected with the vitamin-*A* and glutathione content. H. G. R.

Effect of *X*-rays on the chemical constitution of [human] blood. A. Jankovic (Rep. III Congr. Slav. Pharm., 1934, 281—292).—The concns. of cholesterol, Fe, and other components increase during the irradiation. J. J. B.

Reductions in irradiated skin. P. Wels (Arch. exp. Path. Pharm., 1936, **184**, 101—108).—Irradiation of dead or live pig's skin led to increase of SH groups and of reducing power. P. W. C.

Liberation of biologically active substances from the cut surface of nerve during physiological or artificial stimulation. I. Action on leech-muscle preparations. G. Bergami, G. Cantoni, and T. Gualtierotti (Arch. Ist. Biochim. Ital., 1936, **8**, 267—298).—The properties of Ringer's or eserine–Ringer's solution in which is immersed the freshly cut end of a nerve (*in situ*) stimulated physiologically indicate the presence of a substance (I) resembling acetylcholine (II) and a principle antagonistic to (II), whilst with artificial stimulation there also occurs a factor which sensitises leech-muscle preps. towards (II). (I) is differentiated from (II) by (II) being unaffected by glucose whilst (I) is inactivated. F. O. H.

Oxygen consumption of developing silkworm eggs during artificial hatching. J. Fukuda (Proc. Imp. Acad. Tokyo, 1936, **12**, 269—271).—The O_2 consumption of the eggs treated in five different ways (four involving use of HCl) prior to incubation are examined at various periods during incubation and the results are discussed : HCl treatment increases the O_2 consumption in the developing eggs. J. W. B.

Pharmacological action of deuterium oxide. I. Toxicity and symptoms. Metabolic rate. Water exchanges. H. G. Barbour and J. Trace (J. Pharm. Exp. Ther., 1936, **58**, 460—482).—1 c.c. per 10 g. per day of 99·5% D_2O causes death of white mice in 7 days, when the body is 40—50% saturated and H_2O retention, due to a decreased flow of urine, occurs. After 4 days the body-temp. and metabolic rate diminish. The high η of D_2O appears to impede glomerular filtration and is a factor in D_2O poisoning. H. G. R.

Influence of small dosages of copper on blood formation. J. Somogyi (Magyar orvosi Arch., 1935, **36**, 317—326; Chem. Zentr., 1936, i, 1649).—Injection of $CuSO_4$ (in isotonic NaCl), in amounts $< 1{\cdot}66$ mg. per kg. body-wt., increased the erythrocyte count and hæmoglobin content of rabbit's blood. Larger proportions had an inhibitory action. Beneficial effects of Cu in anæmia etc. were not increased by simultaneous administration of Fe. A. G. P.

Distribution in the organs and elimination of copper following intracardiac injection of copper glycine in guinea-pigs. E. Lasausse, L. Frograin, and C. Pollès (J. Pharm. Chim., 1936, [viii], **24**, 489—499).—The distribution of Cu in the organs of normal and pregnant guinea-pigs following injection of Cu glycine (equiv. to 0·5—4·6 mg. of Cu) is tabulated. The fæcal elimination of Cu was > that in the urine. Modifications of the method (A., 1936, 536) of determining Cu when Mg and Mn are present are described. F. O. H.

Comparison of therapeutic calcium salts. I. Minimum lethal dose by intravenous route of calcium chloride, lactate, gluconate, and pyruvate. U. Baldacci (Arch. Farm. sperim., 1936, **62**, 91—107).—The min. lethal doses in rabbits are 0·0080, 0·0070, 0·0130, and 0·0180 g.-equiv. per kg., respectively. F. O. H.

Duodenal activity. W. J. R. Camp (J. Pharm. Exp. Ther., 1936, **58**, 393—401).—Excess of K in the duodenal cell results in contraction; when removed from the cell by a reduction process and a corresponding excess produced at the cell surface, a relaxation occurs. $KMnO_4$ and $NaMnO_4$ on intravenous injection inhibit adrenaline action, due to their oxidising properties in alkaline solution which may be neutralised by the use of reducing agents. H. G. R.

Action of strontium chloride on the renal excretion of water and sodium chloride. F. Frau (Arch. Farm. sperim., 1936, **62**, 77—90).—Intravenous injection of small doses (<0·001 g.-equiv. per kg.) of $SrCl_2$ into rabbits increases, whilst that of large doses diminishes, the excretion of H_2O and NaCl due to injection of hypertonic aq. NaCl. F. O. H.

Effect of magnesia dust on the organism of the worker. A. Pleschtizer (Arch. Gewerbepath. Gewerbehyg., 1936, **7**, 8—22).—Exposure of man to MgO dust increases Mg, Ca, and the Mg/Ca ratio in the blood-serum and decreases hæmoglobin. M. A. B.

Liver-glycogen after [administration of] ammonium lactate. R. Grant (Trans. Roy. Soc. Canada, 1936, [iii], **30**, V, 73—85).—Glycogen (I) was deposited in the livers of splenectomised rats when NH_4 lactate (II) was given orally after a 24 hr. fast, but not when (II) was perfused directly into the portal circulation under otherwise identical conditions. With splenectomised cats, deposition of (I) following intraportal administration of (II) was more evident in livers with a moderately high fatty acid content than in those with normal or very high vals. J. N. A.

Fixation of sulphonal by endrocrine glands. M. T. Régnier (Compt. rend. Soc. Biol., 1936, **123**, 1041—1042).—Sulphonal is fixed to a considerable extent by the adrenal and pituitary glands. H. G. R.

Action of organic liquids on the skin. (A) H. Oettel. (B) W. Heubner and H. J. Oettel (Arch. exp. Path. Pharm., 1936, **183**, 641—696; **184**, 77—80).—The effect of applying various substances to the intact human skin is investigated. The saturated hydrocarbons are more active than the unsaturated, aldehydes and anhydrides have only slight, and alcohols, ketones, and esters no, activity. The more quickly a substance is removed by the blood, the less is its activity. P. W. C.

Diffusion of halogenated hydrocarbons through the skin. P. Schwander (Arch. Gewerbepath. Gewerbehyg., 1936, **7**, 109—116).—$C_2H_4Cl_2$, $C_2H_3Cl_3$, $C_2H_2Cl_4$, C_2HCl_5, C_2Cl_6, C_2HCl_3, C_2Cl_4, EtBr, EtI, and $CHBr_3$, but not $PbMe_4$ or vinyl esters, penetrated the skin of rabbits and were detected in the expired air. $C_2H_2Cl_3$, $C_2H_2Cl_4$, and C_2Cl_6 caused death. Compounds with b.p. <80° had no narcotic effect; the action of others increased generally with the b.p. M. A. B.

Diethylaminomethylbenzodioxan (883 F.): physiological examination of the optical isomerides. D. Bovet and A. Simon (Bull. Sci. Pharmacol., 1935, **42**, 466—473; Chem. Zentr., 1936, i, 1656).—The *l*-isomeride is the more active. A. G. P.

Cell metabolism and cell division. I. Relation between structures, properties, and biological activities of nitrophenols. G. H. A. Clowes and M. Krahl. **II. Stimulation of cellular oxidation and reversible inhibition of cell-division by di- and tri-halogenophenols.** M. E. Krahl and G. H. A. Clowes (J. Gen. Physiol., 1936, **20**, 145—171, 173—184; cf. A., 1936, 1414).—(I) The respiration of fertilised eggs of *Arbacia punctulata* is stimulated by small concns. of various nitrophenols (I), the optimum for 4 : 6-dinitro-*o*-cresol being $4 \times 10^{-6}M$, when the O_2 consumption is increased about 300%. Higher concns. of (I) diminish respiration, often to < normal. At or about the optimum concn., cell division is blocked; this action is fully reversible over a wide range of concn. Reduction products of (I) show much lower activities. Stimulation of respiration and the block to cell division are possibly due to separate factors. There is an optimum stage in the mitotic cycle for the blocking effect. The effects are probably not due to the (I) acting as oxidation–reduction systems.

II. Di- and tri-halogeno- and mixed nitrohalogenophenols produce similar effects to those of the (I), but are rather less active. Monohalogenophenols, unlike *p*-nitrophenol, are inactive, but, *s*-trihalogenophenols, unlike *s*-trinitrophenols, are active (further evidence against an oxidation–reduction mechanism). These halogenophenols do not significantly increase the body-temp. or respiration rate of rats or dogs. F. A. A.

Stimulation of oxygen consumption and suppression of cell division by di- and tri-halogenated phenols. M. E. Krahl and G. H. A. Clowes (Proc. Soc. Exp. Biol. Med., 1935, **33**, 477—478; A., 1935, 1533).—In fertilised eggs of *Arbacia punctulata* O_2 consumption is stimulated and cell division is reversibly suppressed by 2 : 4-di- and 2 : 4 : 5- and 2 : 4 : 6-tri- but not by 2 : 6-di-halogenated phenols. The metabolic rate in rats and the body-temp of pigeons and dogs are not increased by intravenous injection of 2 : 4-$C_6H_3Cl_2$·OH. W. McC.

Antagonism between acetylcholine and amyl nitrite in the action on the heart. H. Fredericq (Arch. int. Physiol., 1935, **41**, 569—570; Chem. Zentr., 1936, i, 1455).—No antagonism occurs. A. G. P.

Rôle of the adrenaline-secretory activity of acetylcholine in its action on the blood-sugar. F. Jourdan and P. Galy (Compt. rend. Soc. Biol., 1936, **123**, 902—904).—The secretion of adrenaline on intravenous injection masks the hypoglycæmia observed on intramuscular injection. H. G. R.

Physiologically active substance in the body resulting from the administration of acetyl-β-methylcholine chloride by iontophoresis. W. F. Alexander and A. J. Kotkis (J. Pharm. Exp. Ther., 1936, **58**, 439—453).—A substance similar to acetyl-β-methylcholine chloride (I) can be obtained (1 part in 1×10^6) in the perfusate from the limb after iontophoresis with (I) but is not observed after a corresponding treatment with aq. NaCl. H. G. R.

Blood-amylase response to acetyl-β-methylcholine chloride in pancreatectomised dogs. L. Tuchman, A. Schifrin, and W. Antopol (Proc. Soc. Exp. Biol. Med., 1936, **33**, 142—144).—The blood-amylase response to the drug is not elicited after pancreatectomy. P. G. M.

Absorption of bile acids from the intestines. B. Josephson and A. Rydin (Biochem. J., 1936, **30**, 2224—2228).—Aq. Na cholate or glycocholate, injected into the small intestines of rabbits and cats after laparotomy, increases the bile acid content of the heart blood and, to a greater extent, that of the portal blood, indicating absorption by the portal vein. Absorption by the lymph vessels does not occur, since animals jaundiced by ligature of the bile duct show less bile acid in the systemic than in the portal blood; moreover, the lymph of horses contains no cholic acid, even after injection of bile salts into the intestine. F. A. A.

Liver preparation protecting against necrosis from chloroform or carbon tetrachloride administration. J. C. Forbes, R. C. Neale, and J. H. Scherer (J. Pharm. Exp. Ther., 1936, **58**, 402—408).—The prep. of material active by injection is described. The active principle is not choline, glucose, or the pernicious anæmia factor. H. G. R.

Pyramidone, luminal, and similar substances in investigations of agranulocytosis. Y. Schilling (Med. Welt, 1935, **9**, 1808—1809; Chem. Zentr., 1936, i, 1657).—The mechanism of the action of these and other drugs on leucocytes is examined. A. G. P.

Acute narcotic action of aliphatic and aromatic hydrocarbons. I. Effect of single inspirations of various concentrations of benzine, benzene, toluene, and xylene on rabbits and cats. W. E. Engelhardt and W. Estler. **II. Effects of repeated inspirations on white mice.** W. Estler (Arch. Hyg. Bakt., 1935, **114**, 249—260, 261—271; Chem. Zentr., 1936, i, 1258).—I. In low concns. C_6H_6 was less toxic than its homologues, and in high concns. its toxicity was > that of PhMe. Rabbits, in contrast to cats, were more sensitive to PhMe than to xylene (I). Benzine (II) had much smaller effects.

II. Toxicity increased in the order (II), C_6H_6, PhMe, (I). A. G. P.

Experimental porphyrinuria induced by narcotics. W. Laubender (Arch. exp. Path. Pharm.,

1936, **184**, 95).—Small amounts of sulphonal injected into rabbits cause excretion of a pigment which although a porphyrin precursor is not either copro- or uro-porphyrin. The pigment is present in normal urine in small amount but is not increased by injecting other narcotics such as veronal, noctal, and phanodorm. P. W. C.

Effect of terminal procedures on liver-glycogen. W. F. Reindollar (Proc. Soc. Exp. Biol. Med., 1936, **33**, 182—183).—Evipal, its Me derivative, or phanodorm does not depress the liver-glycogen of the rat as compared with decapitation. P. G. M.

[Pharmacology of] *cyclo*propane. I. Determination in air, water, and blood by means of iodine pentoxide. II. Concentrations required in air and blood for anæsthesia, loss of reflexes, and respiratory arrest [in dogs]. B. H. Robbins (J. Pharm. Exp. Ther., 1936, **58**, 243—250, 251—259).—I. The I_2O_5 method is adapted for the determination of *cyclo*propane (I) in air, H_2O, and blood. The distribution ratio of (I) between H_2O and air, and blood and air, is determined.

II. Data are given. The average distribution ratio of (I) between blood and air *in vivo* is 0·492. E. M. W.

Propylene impurities. Hexenes and hexanes. V. E. Henderson and A. H. R. Smith (J. Pharm. Exp. Ther., 1936, **58**, 319—327).—Hexenes produce an unusual type of anæsthesia with concns. approx. equal to those required by the corresponding hexanes. E. M. W.

Effects of anæsthesia on the autoxidation of surviving brain tissue. G. A. Emerson (Proc. Soc. Exp. Biol. Med., 1936, **33**, 171—177).—Glycogenolytic anæsthetics (Et_2O etc.) and adrenaline decrease the rate of autoxidation of rat brain tissue. Amytal inhibits this effect. The action of other narcotics cannot be correlated with autoxidation. P. G. M.

Synthesis of local anæsthetics from cytisine.—See A., II, 80.

Pharmacological modification of bodily performance in sport. M. Baur (Arch. exp. Path. Pharm., 1936, **184**, 51—66).—A lecture. P. W. C.

Changed action of medicinal substances in hypertonic solution. W. Haarmann (Arch. exp. Path. Pharm., 1936, **184**, 95—97).—Whereas injection into a rabbit of 9 mg. of cocaine per kg. led to convulsions lasting 3 min., the same injection in hypertonic Na_2SO_4 into the same rabbit led to convulsions lasting 19 min. No convulsions were obtained on replacing Na_2SO_4 with glucose or NaCl. 1·3 mg. per kg. of picrotoxin led to convulsions lasting 37 min., but in hypertonic NaCl only 2 min., whereas in NaOAc or Na_2SO_4 it caused death. With 20 mg. per kg. of cardiazole, convulsions lasted 10—15 min., but were entirely absent when injected in hypertonic solution. The animals withstood double the lethal dose of morphine when injected in hypertonic NaCl or glucose solution but tolerated less than the lethal dose in NaOAc + $Ca(OAc)_2$. Similar results were obtained with medinal or bromoural. P. W. C.

Effect of normal and caffeine-free coffee on oxygen consumption, pulse rate, and blood pressure [of men]. K. Horst, R. J. Willson, and R. G. Smith (J. Pharm. Exp. Ther., 1936, **58**, 294—304).—Coffee increases O_2 consumption, and slightly increases blood pressure and pulse rate. Caffeine-free coffee has negligible but irregular effects. E. M. W.

Pharmacodynamics of coffee constituents. H. Seel (Med. Welt, 1935, **9**, 1422—1424; Chem. Zentr., 1936, i, 1454).—Treatment of chlorogenic acid (I) by Lendrich's method does not lead to fission into quinic and caffeic acids, although a change is produced in (I) and can be detected physicochemically and pharmacologically. The "changed" acid has less physiological activity. A. G. P.

Actions of diuretic drugs and changes in metabolites in œdematous patients. A. B. Stockton (Arch. Int. Med., 1936, **58**, 891—900).—The increase in blood-Cl preceding diuresis and the concurrent increase in blood- and urine-Cl indicate that both metallic (merbaphen, salyrgan, Na Bi tartrate) and xanthine (theophylline) diuretic drugs act directly on the tissues in general and not only on the kidneys; the latter mechanism applies to digitalis diuresis which is characterised by increased urinary excretion of Cl and simultaneous decreases in urine- and blood-Cl levels. F. O. H.

Action of extracts of shepherd's purse [on animals]. L. Butturini and P. Marangoni (Boll. Soc. ital. Biol. sperim., 1934, **9**, 240—243; Chem. Zentr., 1936, i, 1258).—The extracts, injected intravenously into rabbits, lowered blood pressure but caused no reversal of the action of adrenaline. There was no influence on pregnancy. A. G. P.

Natural coumarins and their action on fish.—See A., II, 29.

Pharmacological action of conessine and *iso*-conessine.—See A., II, 39.

Absorption of *g*-strophanthin by the liver. M. Kiese (Arch. exp. Path. Pharm., 1936, **184**, 99—100).—The amount of strophanthin (I) absorbed was calc. from the difference of the lethal doses for the heart–lung and the heart–lung–liver preps. of dogs. When (I) was infused into the vena cava sup. the absorption was 1·53 and into the portal vein in 10 times the concn. was $3·09 \times 10^{-6}$ g. per g. of liver. P. W. C.

Synthetic derivatives of *k*-strophanthidin. W. Neumann (Arch. exp. Path. Pharm., 1936, **184**, 100—101).—The pharmacological activity of 30 esters of strophanthidin with org. acids is compared with that of the natural glucoside. Some of the esters exceeded the aglucone in activity on the isolated frog's heart and in rabbits but they were less active in cats. P. W. C.

Assay of atropine by the isolated frog's heart. W. Schmid (Arch. exp. Path. Pharm., 1936, **184**, 68).—By pretreatment with atropine (I) and subsequent administration of acetylcholine, reproducible results are obtained for 10^{-7} g. of (I) with an accuracy of ±10—15%. P. W. C.

Chronic morphine poisoning in dogs. VI. Effect of increasing tissue oxidations by dinitrophenol on the excretion of morphine in tolerant and non-tolerant dogs. O. H. Plant and D. Slaughter (J. Pharm. Exp. Ther., 1936, **58**, 417—427).—The excretion of morphine is markedly decreased in non-tolerant, but unaffected in tolerant, dogs. H. G. R.

Fate of hydroxydimorphine following intravenous injection. B. Drevon and A. Richard (Compt. rend. Soc. Biol., 1936, **123**, 964—967).—The alkaloid rapidly disappears from the blood (of dogs) and is found principally in the vascular tissues. H. G. R.

Colour reactions for cardiac glucosides.—See A., II, 52.

Anthelmintics. I. Anthelmintic action of alantolactone. S. Ozeki, M. Kotake, and K. Hayasi (Proc. Imp. Acad. Tokyo, 1936, **12**, 233—234).—When freed from higher terpenoid substances alantolactone, from the root of *Inula helenium*, L., has only a slightly bitter taste and no emetic action. It is less toxic and has greater anthelmintic properties than has santonin (0·1% is effective in 16 hr. and 2 days, respectively). J. W. B.

Fatal poisoning by sodium nitrite. T. A. C. McQuiston (Lancet, 1936, **231**, 1153—1154).—Three fatal cases resulting from food eaten with $NaNO_2$ instead of NaCl are recorded. L. S. T.

Distribution of inhaled mercury. W. Wirth (Arch. exp. Path. Pharm., 1936, **184**, 91—92).—Dogs after breathing air containing 60—145$\times10^{-6}$ g. of Hg per cu.m. for 2·5—8·5 hr. were killed and the Hg contents of the organs determined. The lung-Hg was initially increased by 30—40, the kidney by 5—10, and brain by 6 times. After stopping inhalation, the lung concn. decreased quickly and was about 3 times normal after 3 weeks. In the same time kidney and liver concns. were not decreased. P. W. C.

Minimum fatal doses of selenium, tellurium, arsenic, and vanadium. K. W. Franke and A. L. Moxon (J. Pharm. Exp. Ther., 1936, **58**, 454—459).—The min. fatal doses in mg. per kg. for rats by intraperitoneal injection were: Se 3·25—3·50 as Na_2SeO_3, 5·25—5·75 as Na_2SeO_4; Te 2·25—2·50 as Na_2TeO_3, 20—30 as Na_2TeO_4; As 4·25—4·75 as Na_2HAsO_3, 14—18 as Na_2HAsO_4; V 4—5 as $NaVO_3$; Mo >160 as $(NH_4)_6Mo_7O_{24}$. H. G. R.

Toxicity of food containing selenium: effect on rats. H. E. Munsell, G. M. De Vaney, and M. H. Kennedy (U.S. Dept. Agric. Tech. Bull., 1936, No. 534, 25 pp.).—The threshold lethal dose of Se for rats was 13—18 p.p.m. in the diet. Wheat containing smaller proportions of Se adversely affected growth and reproduction. Storage of Se in the body is not cumulative. Se injury persisted after the toxic diet had been discontinued and nearly all Se had been eliminated. A. G. P.

Toxicity of rhodium. O. H. Plant (J. Pharm. Exp. Ther., 1936, **58**, 428—430).—The toxicity of $RhCl_3$ is low in rats, rabbits, dogs. H. G. R.

Action of tobacco enzyme on rutin and other phenols. C. Neuberg and H. Kobel (Enzymologia, 1936, **1**, 177—182).—Enzyme preps give the typical brown colour of fermented tobacco. E. D. Y.

Colorimetric determination of carbonic anhydrase. F. J. Philpot and J. St. L. Philpot (Biochem. J., 1936, **30**, 2191—2193).—A modification of the method of Brinkman (J. Physiol., 1933, **80**, 171) is described. F. A. A.

Chemical and biochemical dehydrogenation of αα′-dideuterosuccinic acid.—See A., II, 48.

Nicotine inhibition of oxidation and fermentation. G. F. Gause (Nature, 1936, **138**, 976).—Hydronicotine and not *d*-nicotine is responsible for the inhibition of oxidations previously reported (A., 1936, 1416). L. S. T.

Apricot seeds as a source of dehydrogenases. C. Gurchot (Proc. Soc. Exp. Biol. Med., 1935, **33**, 285—287).—Of various plant materials tested, the apricot seed skins were the richest in dehydrogenase. W. O. K.

Dehydrogenase systems. H. von Euler (Arkiv Kemi, Min., Geol., 1936, **12**, B, No. 15, 6 pp.).—A preliminary study of the rôle of co-enzymes and inhibitors on dehydrogenations in heart and skeletal muscle. E. A. H. R.

Mechanism of enzyme action. XIV. Dehydrogenation by *Fusarium lini*, Bolley. O. T. Rotini, E. Dammann, and F. F. Nord (Biochem. Z., 1936, **288**, 414—420; cf. A., 1936, 896).—The dehydrogenation of alcohols by *F. lini* results in the production of AcOH and succinic acid, the final product being either lactic (by decarboxylation) or tartaric acid. Thus *F. lini* contains a zymase, phosphatase, and dehydrogenase. F. O. H.

Enzymic degradation of polyvinyl alcohol. E. Dammann, F. E. M. Lange, M. A. Bredig, and F. F. Nord (Biochem. Z., 1936, **288**, 421—428).—The action of *F. lini* on the alcohol (cf. preceding abstract), during which CO_2 is liberated, is not accompanied by changes in η, rate of diffusion, or *X*-ray pattern; hence no fission in the mol. chain occurs. F. O. H.

Lactucarium. I. G. Schlenk and H. Graf (Arch. Pharm., 1936, **274**, 537—542).—Lactucin has no pharmacological action; it may be a degradation product of the juice. The fresh or dried juice of *Lactuca virosa* oxidises in air. It contains an oxidase, inactivation of which at 80° stabilises the juice. If the juice is kept in a closed vessel, an aq. layer separates; this, when dried by atomisation at 2 mm., gives a pale yellow, H_2O-sol., stable powder, which contains all the activity of the fresh juice. R. S. C.

Aldehyde-reductase in milk and the influence thereon of copper and of bacterial activity. W. Ritter (Landw. Jahrb. Schweiz, 1935, **49**, 873—886; Chem. Zentr., 1936, i, 1740).—Small quantities of Cu inhibit the enzyme, especially in long-period pasteurisation. Certain organisms restrict this action of Cu. H_2O_2 injures the enzyme: metol and quinol do not diminish the time of decolorisation. A. G. P.

Chemistry of catalase. H. Tauber and I. S. Kleiner (Proc. Soc. Exp. Biol. Med., 1935, **33**, 391—392).—Liver-catalase (I) (ox, rabbit, rat) is not split into two inactive components by dialysis against 0·1*N*- or 0·01*N*-HCl but is inactivated by digestion with trypsin. Digested (I) mixed with (I) inactivated by H_2S or KCN is not re-activated on incubation. No re-activation occurs on adding human plasma, ovalbumin, or milk to digested (I). W. McC.

Activation by heat of the catalase of fat. J. Bodnár and J. Bártfai (Baubach) (Z. physiol. Chem., 1936, **244**, 225—228).—The activity of the catalase of fresh pig's fat (taken in winter) is increased 62—112% by heating, the optimal duration of heating and temp. being respectively 2 hr. and 42°. With fat taken in summer, the optimal temp. is 31° and the increase in activity is 28%, whilst with cell-free aq. extract of the fat, the vals. are 45° and 31%, respectively. W. McC.

Cellulase from the slug, *Limax flavus*, Linnæus. W. W. Tribby and E. B. Carmichael (Proc. Soc. Exp. Biol. Med., 1936, **33**, 42—44).—The optimum p_H for this enzyme was 5·0 in OAc′ buffers. It was present in aq. or saline extracts of the liver and in the gastrointestinal contents but not in the stomach or intestinal walls. P. G. M.

Composition of dried meat of the sea-ear; glycogenase of the fresh sea-ear (*Haliotis gigantea*, Gm.). K. Kondo and S. Shinano (J. Agric. Chem. Soc. Japan, 1936, **12**, 1221—1226).—Dried sea-ear contains H_2O 35—38, glycogen 10%, and protein. Glycogenase occurs in fresh sea-ear. E. M. W.

***Acer saccharum*. Amylases of maple sap and their buffering power.** E. Bois and A. Nadeau (Canad. J. Res., 1936, **14**, **B**, 373—380).—The dialysed extract of enzymes from maple sap, acidified with 0·01*N*-HCl has been submitted to electrometric titration with 0·01*N*-NaOH using a differential Sb electrode. The curve connecting p_H and the "buffering power" $t = \Delta m/\Delta p_H$ (Δm = g.-equiv. of reactant added per litre) (cf. Koppel *et al.*, A., 1914, i, 1105) has minima at p_H 4·6—4·9 and 6·5—6·7, thus confirming the earlier conclusion (A., 1935, 658) regarding the presence of two amylases, termed sucro- and cellobio-genic, respectively. J. W. B.

Koji-amylase. Y. Tokuoka (J. Agric. Chem. Soc. Japan, 1936, **12**, 1185—1202).—The extraction of amylase (I) from koji is greatly increased by the presence of neutral salts in the H_2O. Extraction with H_2O removes maltase (II). Subsequent extraction with NaCl yielded (II)-free (I). In saké-mash fermentation (I) is adsorbed on steamed rice. E. M. W.

Effect of hormones and bios extracts on amylase activity. H. J. Bremner and R. H. Clark (Trans. Roy. Soc. Canada, 1936, [iii], **30**, III, 145—148).—Insulin, parathyroid and pituitary extracts, and acetylcholine have no effect on the hydrolysis of starch by malt diastase at p_H 5·0. Adrenaline (0·001—0·01 mg. per c.c.) causes inhibition, but nas no effect in physiological concns. Bios I, IIA and IIB together, or I + IIA stimulate diastatic activity, which increases with increasing concn. IIB or IIB + IIA have little effect, but IIB potentiates the activity of I + IIA. J. L. D.

Rates of digestion of starches and glycogen and the bearing on chemical constitution. II. Liver-amylase. G. E. Glock (Biochem. J., 1936, **30**, 2313—2318).—$COMe_2$-extracted and dried liver preps. of rat, cat, rabbit, and pig in PO_4''' buffer at p_H 6·4 always had maltase activity. Rat and ox sera were also active but cat and rabbit sera were inactive. In the case of pig liver only was there quant. conversion into glucose (I), the reaction being inhibited by glycerol. Maltose (II) was the sole end product with cat, rabbit, and perfused rat liver preps. Unperfused rat liver produced (II) in the early stages but this was gradually converted into (I) as digestion proceeded. The reducing power of rat (perfused and unperfused) and cat liver preps. showed a steady decrease from 17 to 42 hr. due to reversal of enzymic activity. P. W. C.

Enzymic reactions in heavy water. II. Deuterium and the hydrolysis of starch. D. L. Fox and R. Craig (Proc. Soc. Exp. Biol. Med., 1935, **33**, 266—269).—Starch, the labile H of which has been exchanged for D by heating with D_2O, is more rapidly hydrolysed by amylase from the muscle of *Mytilus californianus* than is ordinary starch. W. O. K.

Decomposition of *d*-fructose-6-phosphoric acid to *d*-arabonic acid-5-phosphoric acid and the enzymic scission of the latter.—See A., II, 52.

Hydrolysis and synthesis of cholesteryl esters in the animal organism. P. E. Simola and T. Kalaja (Suomen Kem., 1936, **9**, **B**, 27—28).—Pulped, or aq. extracts of, blood, plasma, serum, liver, spleen, brain, and adrenal of horse, cow, sheep, and swine were incubated for 1—3 days at 37° in presence of PhMe. With sera synthesis of cholesteryl esters (I) sometimes occurred and in no case was hydrolysis observed. Hydrolysis of (I) was observed with liver of horse, cow, and swine, and spleen and brain of cow. Adrenal showed no hydrolysis and synthesis in some cases. The factors determining the reactions are discussed. R. S. B.

Esterase activity of human blood-plasma. B. Vahlquist (Skand. Arch. Physiol., 1935, **72**, 133—160; Chem. Zentr., 1936, i, 1641).—Hydrolysis of acetylcholine by plasma is effected by the same enzyme which hydrolyses tributyrin. The esterase is not concerned in the regulation of vegetative processes of the body. A. G. P.

Asymmetric hydrolysis of esters by enzymes. XI. Simultaneous action of human pancreas-lipase and liver-esterase on a racemic ester. E. Bamann, C. Feichtner, and W. Salzer. **XII. Stereochemical specificity of human pancreas-lipase.** E. Bamann and C. Feichtner (Biochem. Z., 1936, **288**, 310—314, 315—316).—XI. The sp. hydrolysis of *dl*-Et mandelate (I) by liver-esterase is partly inhibited by the presence of active pancreas-lipase. The concomitant inhibitory influence of liberated EtOH and change in substrate composition are discussed.

XII. The optical specificity of the lipase in hydrolysing (I) is independent of the initial concn. of substrate (cf. Ammon and Tabor, A., 1934, 218). F. O. H.

Inhibition of the hydrolysis of butyrylcholine perchlorate by serum in presence of geneserine. E. J. Bozonnet (Compt. rend. Soc. Biol., 1936, **123**, 920—922).—Geneserine inhibits the action of serum-esterase since the hydrolysis of both acetyl- and butyryl-choline is inhibited. H. G. R.

Specificity of aspartase. A. I. Virtanen and T. Laine (Suomen Kem., 1936, **9**, B, 28).—The NH_3 obtained by the action of aspartase on *dl*-aspartic acid corresponded with the amount of *l*-acid present, in confirmation of previous work. R. S. B.

Specificity of aspartase. K. P. Jacobsohn and M. Soares (Enzymologia, 1936, **1**, 183—190).—Crotonic acid and Et fumarate are unaffected by aspartase of "resting" *B. coli*. The enzyme effects addition of NH_3, NH_2OH, and N_2H_4 at the double linking of fumaric acid. With NH_2OH amino-hydroxysuccinic acid is formed E. D. Y.

Stereochemical specificity of aspartase. K. P. Jacobsohn and F. B. Pereira (Compt. rend. Soc. Biol., 1936, **123**, 611—613).—Equiv. amounts of $NH_4^{\cdot}$ are formed by the action of aspartase on *l*-aspartate and on a solution of the racemate containing an equiv. amount of the *l*-isomeride. H. G. R.

Metal ion activation in enzymic catalysis. Arginase.—See A., I, 89.

Urease activity of germinated seeds. A. Venkatasubban, R. Karnad, and N. N. Dastur (Proc. Indian Acad. Sci., 1936, **4**, B, 370—375).—Urease activity in extracts of germinated seeds is > in those of resting seeds. In powdered seeds resting forms yielded the more active product. Germination effects the solubilisation of the desmo-enzyme present in resting seeds. A. G. P.

[Failure of] enzymes to hydrolyse diketopiperazine carboxylic acids. E. Waldschmidt-Leitz and M. Gärtner (Z. physiol. Chem., 1936, **244**, 221—224).—2 : 5-Diketopiperazine-3 : 6-diacetic acid and 2 : 5-diketopiperazinepropionic acid were not hydrolysed by various proteinase and peptidase preps. W. McC.

Comparison of antitryptic activity of egg-white with its capacity to produce a characteristic nutritional disorder. H. T. Parsons [with E. Kelly] (J. Biol. Chem., 1936, **116**, 685—690).—The pellagra-like syndrome due to egg-white is not attributable to its content of antitrypsin. J. N. A.

Activation of partially purified pepsinogen. H. Holter and J. H. Northrop (Proc. Soc. Exp. Biol. Med., 1936, **33**, 72—75).—During activation at p_H 4 there is a parallel increase of N not pptd. by $CCl_3{\cdot}CO_2H$ at 80°. Pepsinogen cannot be activated by trypsin or papain. P. G. M.

Magnesium-activated leucyl peptidase of animal erepsin. M. J. Johnson, G. H. Johnson, and W. H. Peterson (J. Biol. Chem., 1936, **116**, 515—526).—Pig erepsin contains, besides an aminopolypeptidase (Waldschmidt-Leitz), a leucyl peptidase (I), which can be separated by pptn. with $COMe_2$ and then with EtOH. (I) hydrolyses leucyl- and alanyl-diglycine and glycyl-leucylglycine, but not tri- or tetra-glycine. Its activity depends on the presence of $Mg^{\cdot\cdot}$; it thus differs from the aminopolypeptidase of *Aspergillus parasiticus*. Erepsin contains a further dipeptidase. F. A. A.

Proteolytic activity of pancreatic juice, trypsin, and erepsin. C. Lauresco (Arch. int. Physiol., 1935, **42**, 169—182; Chem. Zentr., 1936, i, 1643).—Fission of protein by active juice occurs to the following extents: ovalbumin 75, casein and edestin 55, gelatin 50, gliadin 45%. The resistance of the last two named is associated with their proline and glutamine contents. A. G. P.

Specificity of proteinases. S. Akabori and S. Takase (Proc. Imp. Acad. Tokyo, 1936, **12**, 242—244).—Neither diketopiperazine-acetic, m.p. 217—218°, $[\alpha]_D$ 0° (lit. m.p. 270°) [Et ester, m.p. 207—207·5° (lit. m.p. 211°)], nor -propionic acid, m.p. 222—223° (lit. m.p. 225°), $[\alpha]_D^{28}$ +15·09° [Et ester, m.p. 176—178° (lit. m.p. 140°)], undergoes fission with pure trypsin or trypsin-kinase at p_H 7·7, or with papain at p_H 5 (cf. Ishiyama, A., 1933, 723). J. W. B.

Secretion of bacterial proteases and their dependence on p_H. G. Gorbach and E. Pirch (Enzymologia, 1936, **1**, 191—198).—Young cultures of *B. fluorescens* and *B. pyocyaneus* produce in the culture medium (preferably peptone) a bacterium autolysing proteinase (I) (optimum p_H 7·0). A peptidase (optimum p_H 8·4) remains in the cells. The mol. size of (I) from *B. fluorescens* is < that of the peptidase. E. D. Y.

Enzyme action. I. Determination of pepsin and trypsin in yeast. M. Hecht and H. Civin (J. Biol. Chem., 1936, **116**, 477—488).—Yeast contains a pepsin acting at p_H 1·8, best obtained by lysis by Et_2O. The enzyme is unstable, being inactivated on dilution. F. A. A.

Absorption spectra of dihydropyridine compounds. E. Haas (Biochem. Z., 1936, **288**, 123—125).—Acidification of dihydro-nicotinamide methiodide and -di- and -tri-phosphopyridine nucleotide is accompanied by formation of an absorption band at 300 mμ which is permanent if 0·002% of $NaHSO_3$ is present. The bearing of this phenomenon on the co-enzyme action of C_5H_5N nucleotide is discussed. F. O. H.

Co-enzyme systems of carboxylase. H. Albers and A. Schneider (Naturwiss., 1936, **24**, 794).—Two substances can function as co-enzymes for dialysed yeast carboxylase; one, of unknown composition, is activated further by PO_4''' but not by $Mg^{\cdot\cdot}$, and the other, adenylic acid (I), by both PO_4''' and $Mg^{\cdot\cdot}$. The former is the more potent. (I) can be replaced by cozymase-(II) inactivated by alkali, but not by (II) itself. Both holo-enzymes are inhibited by the MeCHO produced, the inhibition being partly reversed in the presence of glucose. E. A. H. R.

Action of cozymase as the specific co-enzyme of lactic dehydrogenase from heart muscle. E. Adler, H. von Euler, and H. Hellström (Nature,

1936, **138**, 968—969).—The co-enzyme of lactic dehydrogenase is identical with that of alcohol dehydrogenase and therefore with cozymase. Dihydrocozymase can act as the prosthetic group of lactic dehydrogenase in the reduction of $AcCO_2H$ to lactic acid. L. S. T.

Participation of adenylic acid and cozymase in phosphorylation. H. VON EULER and E. ADLER (Arkiv Kemi, Min., Geol., 1936, **12**, **B**, No. 12, 6 pp.).—The dependence of the rate of fermentation by apozymase on the amount of adenylic acid (I) added shows that (I) functions as a PO_4''' carrier between phosphopyruvic acid and glucose. Cozymase (II) and (II) inactivated by alkali are more active carriers than (I). This function of (II) is probably connected with a group similar to (I). By chromatographic purification of (II) preps. of moderate purity, a second co-enzyme is obtained, which may be identical with the Warburg co-enzyme from red blood cells. E. A. H. R.

Enzymic mechanism of oxidation–reduction processes in fermentation and glycolysis. H. VON EULER and E. ADLER (Arkiv Kemi, Min., Geol., 1936, **12**, **B**, No. 16, 6 pp.).—A discussion of the suggested mechanism of alcoholic fermentation by the coupling of the triose phosphate and alcohol dehydrogenases with flavin enzyme (I) and cozymase (II). $CHO{\cdot}CH(OH){\cdot}CH_2{\cdot}O{\cdot}PO(OH)_2$ dehydrogenase is contained in the EtOH ppt. of yeast maceration juice. It requires the co-operation of (I) and (II) for its action. E. A. H. R.

Pentosephosphoric acid from cozymase. F. SCHLENK (Arkiv Kemi, Min., Geol., 1936, **12**, **B**, No. 17, 4 pp.).—Cozymase (I) gives pentosephosphoric acid (II) on acid hydrolysis. The yield of (II) proves that both carbohydrates in (I) are pentoses. The pentose is probably *d*-ribose. Measurements of the rate of hydrolysis of (II) indicate that it is a mixture of ribose-3- and -5-phosphoric acids. E. A. H. R.

Nicotinamide from cozymase. H. ALBERS, F. SCHLENK, and H. VON EULER (Arkiv Kemi, Min., Geol., 1936, **12**, **B**, No. 21, 3 pp.).—The low N vals. recorded for the picrolonate of nicotinamide isolated from cozymase and the Warburg co-enzyme from red blood cells (cf. Warburg *et al.*, A., 1935, 121; Euler *et al.* A., 1936, 245) are due to EtOH of crystallisation. E. A. H. R.

Action of ultra-violet light on cozymase. H. VON EULER and F. SCHLENK (Arkiv Kemi, Min., Geol., 1936, **12**, **B**, No. 19, 5 pp.).—Ultra-violet irradiation of cozymase (I) destroys its fermentation activating powers, but its activity as a PO_4''' carrier is retained. The rate of inactivation decreases with increasing (I) concn. The action of ultra-violet light is compared with that of alkali (cf. following abstract). E. A. H. R.

Behaviour of cozymase to alkali. F. SCHLENK and H. VON EULER (Arkiv Kemi, Min., Geol., 1936, **12**, **B**, No. 20, 5 pp.).—Hydrolysis of cozymase with dil. NaOH gives nicotinamide and a substance (I) containing (probably) 1 mol. of adenine, 2 mols. of pentose, and 2 of H_3PO_4. (I) retains its power as a PO_4''' carrier but not as a H carrier. E. A. H. R.

Cozymase. F. SCHLENK and H. VON EULER (Naturwiss., 1936, **24**, 794—795).—A possible structure for cozymase based on its monobasicity and the results of alkaline hydrolysis is suggested. E. A. H. R.

Non-replaceability of cozymase in the enzymic formation of lactic acid. O. MEYERHOF and P. OHLMEYER (Naturwiss., 1936, **24**, 741—742).—The reaction, triosephosphoric acid + $AcCO_2H$ → phosphoglyceric acid + lactic acid (I) proceeds slowly in presence of muscle extract (containing F') dialysed for 15 hr., to which a small quantity of $Mg^{\cdot\cdot}$ has been added, and is markedly accelerated by addition of adenylic acid (II). When dialysis is continued for 36—48 hr. no (I) is formed either with or without the addition of (II). Alkali-inactivated cozymase (III) (cf. Euler and Günther, A., 1935, 1278) is likewise ineffective, but (III) itself completely restores the rate of formation of (I). Much more (III) is required for max. activity in the absence than in the presence of (II). The disappearance of $AcCO_2H$ runs parallel with the formation of (I). Probably (III) cannot be replaced by (II) in the oxido-reductive phase of (I) formation. This result is similar to that previously obtained for the yeast fermentation reactions. W. O. K.

Physiological re-oxidation of reduced yellow enzyme. H. THEORELL (Biochem. Z., 1936, **288**, 317—328).—The kinetics of the reactions between mol. O_2, cytochrome-*c* (I), and the respiratory enzyme system of Warburg and Christian indicate that the reduced (dihydro-) co-enzyme reacts with the yellow enzyme (II) to give co-enzyme (III) and reduced (dihydro-) (II) which can be oxidised by Fe'''; oxidised (I) oxidises reduced (II) but not (III) (cf. A., 1935, 1277). The alternative mode of oxidation of reduced (II), *i.e.*, by the O_2 normally present in the cell, is shown to be negligible by the practically complete absence of formation of H_2O_2. The physiological rôle of (II) is discussed. F. O. H.

Physico-chemical characteristics of the yellow respiratory enzyme. R. A. KEKWICK and K. O. PEDERSEN (Biochem. J., 1936, **30**, 2201—2205).—Sedimentation velocity and diffusion data indicate that the yellow enzyme (I) of Warburg and Christian has mol. wt. approx. 80,000. Agreement of this val. with that from determinations of flavin indicates that (I) has one flavin group per mol. Electrophoretic data give p_H 5·22 as the isoelectric point. F. A. A.

Lacto-mannitic enzymes. IV. Influence of the medium on the fermentation of glucose and fructose. V. BOLCATO (Annali Chim. Appl., 1936, **26**, 423—427; cf. A., 1936, 628).—If the medium is maintained at p_H 7—8, glucose and fructose yield the same products of fermentation, viz., lactic acid, AcOH, EtOH, and CO_2. L. A. O'N.

Leucocyte phosphatases. N. FIESSINGER and F. BOYER (Enzymologia, 1936, **1**, 172—176).—Leucocytes from oxalated plasma and exudates have a monophosphoesterase activity > that of serum. E. D. Y.

Plant phosphatases. II. Activation of taka-phosphoesterase by substances of similar con-

stitution. E. Bamann and W. Salzer (Biochem. Z., 1936, **288**, 299—300).—The activation of the phosphoesterase of *Aspergillus oryzæ* by citric acid also occurs with other acids with $\cdot CO\cdot CO_2H$ or $\cdot CH(OH)\cdot CO_2H$. F. O. H.

Preparation of phosphoglyceric and glycerophosphoric acids by decomposition of hexose diphosphate by yeast. A. Hahn, H. Ottawa, and E. Mehler (Z. Biol., 1936, **97**, 573—577).—Phosphoglyceric (I) and glycerophosphoric acid (II) were prepared from the fermentation mixture of Vercellone and Neuberg (A., 1935, 1418). After removal of the yeast the solution is made alkaline with aq. NH_3 and PO_4''' is pptd. by $Mg(OAc)_2$. (I) and (II) are pptd. from the filtrate by $Pb(OAc)_2$. The Pb salts are decomposed by H_2S and (I) is pptd. as the acid Ba salt. (II) is again pptd. as the Pb salt, and after decomp. with H_2S is pptd. as the quinine salt. (I) also gives a *quinine* salt (m.p. 199°). E. A. H. R.

Effect of temperature, variety of juice, and method of increasing sugar content on maximum alcohol production by *Saccharomyces ellipsoideus*. L. Hohl and W. V. Cruess (Food Res., 1936, **1**, 405—411).—Tomato juice attained the highest EtOH content (15·1%) by "straight fermentation" and grapefruit juice (17·8%) by "syruped fermentation." Grape juice is superior to pure sugars in syruping the fermentation. EtOH formation is max. at 20—22° and decreases rapidly at 30—37°. P. G. M.

Transformation of furfuraldehyde by fermenting yeast. P. Liang (Z. physiol. Chem., 1936, **244**, 238—240; cf. Lintner *et al.*, A., 1911, ii, 816).—The substance believed to be α-furyl trimethylene glycol yields furfuraldehyde (I) and MeCHO on oxidation with $Pb(OAc)_4$ and hence is *as*-furyl methyl glycol (II) which with $COMe_2$ and P_2O_5 yields the iso*propylidene* derivative, b.p. 193·5—194·5°/712 mm. Probably (II) is produced during the fermentation from the condensation product of (I) and MeCHO by hydrogenation. W. McC.

Action of 4-quinolinepyruvic acid on yeast. C. Neuberg and G. Minard (Enzymologia, 1936, **1**, 161—167).—Decarboxylation of $AcCO_2H$ by yeast and yeast extracts is unaffected by 4-quinolinepyruvic acid (I). The Na salt inhibits. (I) stimulates CO_2 production from glucose. E. D. Y.

Trehalose and yeast. I. K. Myrbäck and B. Ortenblad (Biochem. Z., 1936, **288**, 329—337).—Press-yeast (except from brewer's bottom yeast) contains, in addition to trehalose (I), small amounts of a more complex carbohydrate. The rate of fermentation of (I) by freshly prepared dried yeast and Lebedev's yeast-juice is approx. 25% of that of glucose (II); with old dried yeast, the rates are equal. Apo- and co-zymase ferment (I). The fermentation characteristics of (I) and (II) are compared. F. O. H.

Trehalose formation in cell-free alcoholic fermentation. H. Sobotka and M. Holzman (Enzymologia, 1936, **1**, 168—171).—Glucose metabolised by Lebedev juice is only partly oxidised to CO_2. A non-reducing, strongly dextrorotatory substance resembling trehalose is formed. E. D. Y.

***Zygosaccharomyces pini*, a new species of yeast associated with bark beetles in pines.** E. C. Holst (J. Agric. Res., 1936, **53**, 513—518).—The yeast is described. Among the common sugars only glucose, fructose, and mannose are fermented. A. G. P.

Preparation of crude bios V, and its influence on the reproduction of certain micro-organisms. M. E. Elder (Trans. Roy. Soc. Canada, 1936, [iii], **30**, III, 89—97; cf. A., 1936, 522).—Tannin ppts. bios V from tomato juice together with traces of bios IIA and IIB which have no effect on the reproduction of *S. cerevisiæ*; boiling $Ca(OH)_2$ destroys V, which is completely adsorbed on C. *S. valbyensis* does not reproduce in presence of crude V and IIA, or crude IIB, but does so with inositol and crude IIB; IIA favours the process. With crude bios V and "bios V reagent" [*i.e.*, bios V treated with $Ca(OH)_2$ and with the Ca removed], the crop of *S. cerevisiæ* is $\ll$ and that of *S. valbyensis* a little $>$ when V, inositol, IIA, and IIB are used, showing that some other unknown constituent is concerned in the reproduction of these organisms. Bios V is determined by its effect on the reproduction of yeast in presence of excess of bios V reagent if the organism count (24 hr.) is < 1300. A method for obtaining MeOH solutions of V from tomato juice is described. EtOH trebles the yield of yeast in presence of V and V reagent (cf. A., 1922, i, 501). MeOH, $Pr^{\beta}OH$, and glycerol have no effect. Bios requirements of various organisms for rapid reproduction are described; their individuality in this respect is apparent. J. L. D.

Wildier's bios. W. L. Miller (Trans. Roy. Soc. Canada, 1936, [iii], **30**, III, 99—103).—Tomato juice, treated with tannin and Pb acetate, contains 70% of the original bios. Norite removes IIB, which is eluted with $COMe_2$–aq. NH_3; treatment of the eluent with Hg and Cu acetates, MeOH, and BuOH affords a prep. of IIB. The solution, freed from IIB, is treated with Cu and Hg acetates and then contains 80% of the original IIA. The yeast crop in media containing glucose, salts, inositol, and IIB is much increased when β-alanine (cf. A., 1936, 896) and *γ-l*-leucine, alone of many NH_2-acids, are added. The properties of IIA are probably due to these acids. J. L. D.

Preparation of galac yeast. G. W. Kirby and L. Atkin (J. Biol. Chem., 1936, **116**, 511—513).—The prep. of a galactose-containing medium from lactose is described; bakers' yeast grown on this medium yields galac (*i.e.* galactose-fermenting) yeast. F. A. A.

Transformation of lactic acid by moulds. T. Chrząszcz and R. Schillak (Biochem. Z., 1936, **288**, 359—368).—All the moulds examined (species of *Penicillium*, *Dermatium*, *Monilia*, *Rhizopus*, *Aspergillus*, and *Mucor*) utilise lactic acid (I) (as Ca salt) with production of $EtCO_2H$, AcOH, $PrCO_2H$, MeCHO, and, except most species of *Aspergillus*, HCO_2H. With some moulds, citric acid, EtOH, or $COMe_2$ is formed. The moulds were divisible into three groups according to their mode of metabolising (I) and to the resultant end-products. F. O. H.

Biochemistry of micro-organisms. LII. Isolation, properties, and constitution of terrestric

acid (ethylcarolic acid), a metabolic product of *Penicillium terrestre*, Jensen. J. H. Birkinshaw and H. Raistrick (Biochem. J., 1936, **30**, 2194—2200).—Three different strains of *P. terrestre*, Jensen, produce from Raulin–Thom glucose medium a monobasic *acid* (I), $C_{11}H_{14}O_4$, m.p. 89°, $[\alpha]_{5461}^{20}$ +61·1° in H_2O. On acid hydrolysis it yields CO_2 and acetoin as well as a lactone shown to be *l-hexolactone*, b.p. 219° (uncorr.), $[\alpha]_{5461}^{20}$ −58·11°. Hence (I) is an ethylcarolic acid and its hydrate is α-(*l*-γ-hydroxy-*n*-hexoyl)-*l*-γ-methyltetronic acid. F. A. A.

Effect of synthetic vitamin-B_1 on a micro-organism. W. H. Schopfer (Ber. deut. bot. Ges., 1936, **54**, 559—560).—Synthetic -B_1 produces the same growth-stimulating effect on *Phycomyces* as do natural preps. A. G. P.

Cation antagonism in cultures of *Saprolegnia*. F. Moreau (Compt. rend., 1936, **203**, 809—811; cf. A., 1936, 1149).—KCl–$MgCl_2$ and KCl–$CaCl_2$ mixtures were less toxic to the organism than equiv. solutions of either salt alone. For each mixture there is a definite proportion at which toxic effects are min. Antagonism is very marked between $K^{\cdot}$ and $Ca^{\cdot\cdot}$. A. G. P.

Composition of beetroot tumours caused by *B. tumefaciens*. A. Berthelot and G. Amoureux (Compt. rend. Soc. Biol., 1936, **123**, 942—944). H. G. R.

Glutathione and ascorbic acid content of beetroot tumours caused by *B. tumefaciens*. A. Berthelot and G. Amoureux (Compt. rend. Soc. Biol., 1936, **123**, 944—946).—The contents of glutathione and ascorbic acid are increased in the infected tissue. H. G. R.

Optical properties of fermentation lactic acids. V. Action of acetone-butyl alcohol-producing organism on optically active lactic acids. H. Katagiri and K. Kitahara (J. Agric. Chem. Soc. Japan, 1936, **12**, 1217—1220; cf. A., 1936, 1419).—*Cl. acetobutylicum* causes racemisation of lactic acids by the action of racemiase. E. M. W.

Biological properties of *Bacterium typhi flavum*. I. Malek (Compt. rend. Soc. Biol., 1936, **123**, 923—925).—The organism belongs to the coli–typhoid group and more closely resembles the saprophytes. H. G. R.

Influence of variable quantities of asparagine and glycerol on the growth of bovine *B. tuberculosis* and on the p_H of cultures in Sauton's medium. R. K. Goyal (Compt. rend. Soc. Biol., 1936, **123**, 871—873).—The max. growth is obtained with 0·5% of asparagine (I) or 6% (vol.) of glycerol (II). With concns. of (I) between 0·1 and 0·5% the culture remains acid but above this val. becomes alkaline. Cultures containing 0·5—1% of (II) become alkaline. H. G. R.

Action of salts on bacteria. M. Ingram (Rep. Food Invest. Bd., 1935, 53—57).—The respiration of certain micrococci and bacilli is increased by addition of $>0{\cdot}05M$-NaCl, and diminished by $>0{\cdot}05M$. No difference was observed in the behaviour of organisms tolerating, and those not tolerating, high concns. of salt. $NaNO_3$ decreased the O_2 uptake, being itself reduced to $NaNO_2$. E. C. S.

Neutralising action of adrenaline hydrochloride on tetanus toxin *in vitro*. R. Boiseau (Compt. rend. Soc. Biol., 1936, **123**, 1077—1078). H. G. R.

Ultracentrifugal crystallisation of tobacco mosaic virus protein. R. W. G. Wyckoff and R. B. Corey (Science, 1936, **84**, 513).—A cryst. virus protein is directly obtained when the juice of plants infected with the tobacco mosaic disease is centrifuged at 25,000 r.p.m. The *X*-ray pattern is indistinguishable from that of the protein prepared from the juice by chemical means. L. S. T.

Liquid crystalline substances from virus-infected plants. F. C. Bawden, N. W. Pirie, J. D. Bernal, and I. Fankuchen (Nature, 1936, **138**, 1051—1052).—By further purification of the cryst. protein possessing the properties of tobacco mosaic virus (cf. A., 1936, 1562) the protein in aq. solution (concn. >2%) separates into a lower liquid cryst. layer and an upper layer which shows anisotropy of flow. The liquids form gels on drying, and *X*-ray analysis shows a common pattern corresponding with a repeat unit of $3 \times 22{\cdot}2 \pm 0{\cdot}02$ A. in the cryst., liquid, and gel stages; hexagonal close-packing is indicated in the gel stage, and parallel, charged, rod-like mols. in the solution. The length of the mols. is >1000 A. and the width approx. 0·1 of the length. This gives a min mol. wt. in agreement with Svedberg's estimate of 17×10^6. These rods are probably the virus particles. L. S. T.

Immunology of mosaic diseases. IV. Effects of acetone, lead subacetate, barium hydroxide, aluminium hydroxide, trypsin, and soils on the antigenic property of tobacco mosaic juice. T. Matsumoto and K. Somazawa (J. Soc. Trop. Agric. Taiwan, 1934, **6**, 671—682).—Serological tests with partly purified virus, freed from accretions by treatment with appropriate reagents, showed that the antigenic property of the mosaic juice persisted for the duration of infectivity. Although trypsin destroys the infectivity of the virus only when the latter is treated with $COMe_2$ previous to contact with the enzymes, the antigenic property remains unimpaired in $COMe_2$-treated and control juices. Ch. Abs. (*p*)

Ultrafiltration of the virus of equine encephalomyelitis. J. H. Bauer, H. R. Cox, and P. K. Olitsky (Proc. Soc. Exp. Biol. Med., 1935, **33**, 378—382).—The virus passes through collodion membranes having average pore diameter 66 mμ but not through those of 60 mμ. W. McC.

Second form of the virus of foot and mouth disease. G. Pyl (Z. physiol. Chem., 1936, **244**, 209—217).—The naturally occurring virus is stable in neutral solution only but is irreversibly converted by acid and alkali into a second infectious form stable only in acid and alkaline solution. The conversion probably consists in an alteration of the virus itself and not in an alteration of accompanying material. The viruses of smallpox and chicken cholera do not behave analogously. W. McC.

Ultrafiltration and approximate dimensions of the virus of Nicholas-Favre disease. C. Levaditi, M. Païc, and D. Krassnoff (Compt. rend. Soc. Biol., 1936, **123**, 1048—1050).—With increasing virulence a decrease in size was observed, that of the most virulent strain being 100—140 mμ. H. G. R.

Approximate size of the standard (Paris) virus of rabies and the virus of street rabies of dogs. C. Levaditi, M. Païc, and D. Krassnoff (Compt. rend. Soc. Biol., 1936, **123**, 866—868).—Ultrafiltration curves give an approx. particle size of 140—210 and 160—240 mμ for the two viruses, respectively. H. G. R.

Propagation of rabies virus in tissue culture and the successful use of culture virus as an antirabic vaccine. L. T. Webster and A. D. Clow (Science, 1936, **84**, 487—488).—Cultivation of rabies virus in tissue culture is described. When used as a vaccine, the culture virus protects mice against "street rabies" virus. After a single peritoneal injection dogs remain healthy and produce neutralising antibodies in their sera against the homologous "street" virus strain within 14 days. L. S. T.

Preservation of viruses with saturated sodium chloride solution. F. C. Lin, T. J. Kurotschkin, and C. V. Bernaradsky (Proc. Soc. Exp. Biol. Med., 1935, **33**, 332—334).—Rinderpest virus suffers no attenuation during 4 weeks' contact with the solution. The potency of vaccine virus decreases in 5 weeks' contact to almost the same extent as does the virus in glycerol. The potency of dysentery Shiga bacteriophage preserved in the solution for >3 months is 400 times that of untreated virus. W. McC.

Purification of bacteriophage and a respiratory pigment in *Escherichia coli communis*. K. Meyer, R. Thompson, D. Khorazo, and J. W. Palmer (Proc. Soc. Exp. Biol. Med., 1936, **33**, 129—133).—A method of purification is described. A violet-red pigment, characteristic of the strain, was isolated by way of the phosphotungstate from a 0·05*N*-NaOH extract of $COMe_2$-dried bacteria. P. G. M.

Effect of p_H on heat-inactivation of bacteriophage. A. P. Kreuger and E. J. Scribner (Proc. Soc. Exp. Biol. Med., 1936, **33**, 21—23).—Heat-inactivation of bacteriophage is minimal at p_H 7·5 and is characteristic of protein denaturation as in the case of some enzymes. P. G. M.

Effect of sublethal doses of monochromatic ultra-violet radiation on bacteria in liquid suspensions. A. Hollaender and J. T. Curtis (Proc. Soc. Exp. Biol. Med., 1936, **33**, 61—62).—The growth of irradiated cultures is retarded but on completion of growth the same no. of organisms is present as in the control. P. G. M.

Freezing and death of bacteria. R. B. Haines (Rep. Food Invest. Bd., 1935, 31—34).—The death rate of *B. pyocyaneus* in the frozen state is at a max. at −2°. *Staphylococcus aureus* and the spores of various organisms for the most part survive rapid freezing to −70°. Other vegetative cells vary in their resistance to this treatment. E. C. S.

Effect of pure ozone on bacteria. R. B. Haines (Rep. Food Invest. Bd., 1935, 30—31).—Growth of *B. coli* in Nelson's medium is retarded by 4 p.p.m. of O_3 in the atm. and prevented by 10 p.p.m., the O_3 being admitted simultaneously with inoculation. When growth is established, >200 p.p.m. are needed to arrest it. E. C. S.

Resistance of bacteria and embryonic tissue to germicides. VI. Iodine trichloride. A. J. Salle and A. S. Lazarus (Proc. Soc. Exp. Biol. Med., 1936, **33**, 8—9).—ICl_3 is relatively non-toxic to chick heart tissue but is > twice as toxic to *Staphylococcus aureus*, the toxicity index being 0·4. P. G. M.

Resistance of bacteria and of embryonic tissue to germicides. VII. Potassium mercuric iodide. A. J. Salle and A. S. Lazarus (Proc. Soc. Exp. Biol. Med., 1935, **33**, 393—395; cf. preceding abstract).—K_2HgI_4 is much more toxic than PhOH to *S. aureus* and to heart tissue of the chick embryo. W. McC.

Inhibitory action of sodium citrate on the bactericidal power of human blood. A. Grimberg, S. Mutermilch, and E. Agasse-Lafont (Compt. rend. Soc. Biol., 1936, **123**, 1045—1048).—Whilst 2% of Na citrate partly inhibits the growth of coliform bacilli, 3% inhibits the bactericidal power of the blood. H. G. R.

Mode of action of *p*-aminobenzenesulphonamide and prontosil in hæmolytic streptococcal infections. L. Colebrook, G. A. H. Buttle, and R. A. Q. O'Meara (Lancet, 1936, **231**, 1323—1326).—*p*-$NH_2 \cdot C_6H_4 \cdot SO_2 \cdot NH_2$ (I) has a bacteriostatic and bactericidal action against small numbers of hæmolytic streptococci in culture medium and in blood. Prontosil (II) is active only after reduction. After injection of (I) or (II), the blood of man or animals is bactericidal to hæmolytic streptococci. L. S. T.

Effect of acids on carbocyclic antiseptics. F. W. Hartman and V. Schelling (Proc. Soc. Exp. Biol. Med., 1935, **33**, 469—471).—The bactericidal effect of amyltricresol and similar compounds is increased, frequently greatly, by addition of tannic acid or HCl (at p_H 2—3), compounds effective against certain groups of bacteria only often being made effective against all groups. W. McC.

Photodynamic action of methylene-blue on bacteria. T. Tung (Proc. Soc. Exp. Biol. Med., 1935, **33**, 328—330).—The bactericidal action of saturated aq. methylene-blue in ordinary electric light varies widely with the micro-organism used, the resistance of Gram-negative organisms being apparently > that of Gram-positive. W. McC.

Protein metabolism in experimental adrenal insufficiency. S. Thaddea (Arch. exp. Path. Pharm., 1936, **184**, 105—107).—In cats after bilateral adrenalectomy, the blood-residual N is increased, the increase being reversed by simultaneous injection of ox hormone (pancortex). Urinary N excretion is decreased after extirpation, the effect being also reversed on administration of hormone. P. W. C.

Sodium and water metabolism in relation to disturbances of carbohydrate metabolism after

adrenalectomy. F. Verzár and L. Laszt (Nature, 1936, **138**, 844).—In rats the selective absorption of glucose (I) is inhibited after adrenalectomy, and ingestion of (I) produces loss of $Na^{\cdot}$ and H_2O into the intestine with consequent diarrhœa. The effect may be lethal, but can be prevented by simultaneously giving Na salts. The results may be related to that previously observed (A., 1936, 1567) with vitamin-B_2 on adrenalectomised animals. L. S. T.

Effect of continuous intravenous injections of adrenaline in Addison's disease. A. Baudouin, E. Azérad, and J. Lewin (Compt. rend. Soc. Biol., 1936, **123**, 858—859).—No increase in blood pressure was observed. H. G. R.

Adrenal cortex and fat transport. F. Verzár and L. Laszt (Biochem. Z., 1936, **288**, 356—358).—The depletion of fat from the liver of P-poisoned rats (A., 1936, 1018) is prevented (and the liver-fat may increase to twice the normal val.) by administration of adrenal cortex hormone, flavinphosphoric acid, or yeast preps. F. O. H.

Adrenal cortex and fat absorption. L. Laszt and F. Verzár (Biochem. Z., 1936, **288**, 351—355).—That diminished fat absorption in adrenalectomised rats is reinstated by administration of adrenal cortex hormone (I) is confirmed (cf. A., 1936, 1018). The rate of absorption is not increased above normal levels by (I) in either normal or adrenalectomised rats. The action of flavinphosphoric acid preps. (vitamin-B_2) resembles that of (I). F. O. H.

Test for adrenal cortex hormone and ascorbic acid in guinea-pigs treated with diphtheria toxin. W. Herbrand (Endokrinol., 1935, **16**, 236—237; Chem. Zentr., 1936, i, 1247—1248).—Injection of "pancortex" with ascorbic acid prevented death of toxin-treated animals. Standardised treatment permits determination of the hormone. A. G. P.

Use of pituitary stains : numerical ratios in the anterior epithelium : reciprocal relations. A. L. Burgdorf (Endokrinol., 1935, **16**, 148—160; Chem. Zentr., 1936, i, 1247).—Relations between the proportions of acidophile, primary, and basophile cells are examined. A. G. P.

Action of the carbohydrate-metabolism hormone of the anterior pituitary on the saturated and unsaturated fatty acids of the liver. K. J. Anselmino, G. Efkemann, and F. Hoffmann (Z. ges. exp. Med., 1935, **97**, 44—50; Chem. Zentr., 1936, i, 1446).—The hormone, which is obtained from blood after carbohydrate ingestion or from aq. extracts of the anterior pituitary by ultrafiltration at p_H 5·3, effects a decrease in the unsaturated and total fatty acids of the liver and a decrease in glycogen. The action on glycogen reaches max. earlier than that on the acids. A. G. P.

Effect of the parathyrotropic hormone of the anterior pituitary in different animals. K. J. Anselmino, L. Herold, and F. Hoffmann (Z. ges. exp. Med., 1935, **97**, 51—59; Chem. Zentr., 1936, i, 1445—1446).—Rats are the most suitable animals for evaluating the hormone. A. G. P.

Quantitative studies with the thyrotropic hormone [of anterior pituitary gland]. W. K. Cuyler, B. F. Stimmel and D. R. McCullagh (J. Pharm. Exp. Ther., 1936, **58**, 286—293).—Injection of the hormone decreases the I content of the thyroid glands of guinea-pigs considerably but affects immature rats only slightly. The rate of metamorphosis of tadpoles is accelerated by very small doses. E. M. W.

Pituitary hormone antagonism. S. L. Leonard, F. L. Hisaw, and H. L. Fevold (Proc. Soc. Exp. Biol. Med., 1935, **33**, 319—321).—The action of antuitrin *S* in stimulating the development of the ovaries of immature hypophysectomised rats is inhibited by certain extracts of the anterior lobe of the pituitary gland. The inhibiting substance is associated with the luteinising hormone, but luteinising extracts are not always inhibitory. W. O. K.

Elaboration of hormones by pituitary cells growing *in vitro*. E. Anderson and W. Haymaker (Proc. Soc. Exp. Biol. Med., 1935, **33**, 313—316).—When cultured *in vitro* the pars intermedia cells of the posterior lobe of the pituitary continued to produce the melanophore-expanding substance. Production of hormones by anterior lobe cells growing *in vitro* could not be detected. W. O. K.

Inhibition of action of pituitary hormones by animal sera. K. W. Thompson and H. Cushing (Proc. Roy. Soc., 1936, **B**, **121**, 501—517).—Prolonged injection of gonadotropic extracts produced in canine sera a principle which antagonised the action of the hormone in other animals. The antagonistic principle is not species-sp. The possibility of formation of an antibody or of an antihormone in the dog or in the subsequently treated animal is considered. A. G. P.

Thyrotropic pituitary hormone. P. Starr (Proc. Soc. Exp. Biol. Med., 1935, **33**, 462—464).—In healthy persons, ovariectomised women, and persons suffering from goitre the increase in the basal metabolic rate produced by injecting the hormone exhibits great variations in degree. Hyperthyroidism is sometimes temporarily exacerbated by the hormone. W. McC.

Relationship of precipitin titres to gonadotropic inhibitory action of monkey sera. E. L. Gustus, B. K. Meyer, and J. H. Dingle (Proc. Soc. Exp. Biol. Med., 1935, **33**, 257—261).—Repeated injection of highly purified gonadotropic hormone, prepared from the serum of pregnant mares, into female monkeys produced in the serum of the latter a sp. inhibitory substance (I) and occasionally small amounts of precipitin (II). (I) and (II) are probably not identical. W. O. K.

Purification of gonad-stimulating principle from serum of pregnant mares. A. E. Meyer (Proc. Soc. Exp. Biol. Med., 1935, **33**, 433—436).—A simple method is described. Loss of approx. 33% of the principle is involved. W. McC.

Gonadotropic substance in the blood of normal humans. S. C. Freed (Proc. Soc. Exp. Biol. Med., 1935, **33**, 309—310).—Normal human blood-serum from males or females contains small quantities of

a substance similar to "prolan *B*," the presence of which may be demonstrated by means of its synergistic effect with suitable anterior pituitary extracts. W. O. K.

Occurrence of an œstrogenic substance in the sexual skin of monkeys. R. B. Fisher, P. L. Krohn, and S. Zuckerman (Biochem. J., 1936, **30**, 2219—2223).—Monkeys and baboons, injected with œstrone, show marked swelling of the sexual skin and genitals. The occurrence of compounds having œstrogenic activity is shown in the active sexual skin and its exudate, and in the liver. F. A. A.

Poliocidal property of pregnant mare serum. C. W. Jungeblut (Proc. Soc. Exp. Biol. Med., 1936, **33**, 137—141).—The presence of poliocidal substances in the serum of pregnant mares is related to pregnancy but cannot be correlated with the gonadotropic hormone content. P. G. M.

Oestriolglycuronide. S. L. Cohen, G. F. Marrian, and A. D. Odell (Biochem. J., 1936, **30**, 2250—2256; cf. A., 1936, 503).—Improvements in the method of extraction previously described enable the yield of the glycuronide (I), m.p. 196—236° [*Na* salt, $C_{24}H_{31}O_9Na + 0{\cdot}5MeOH$, m.p. approx. 305° (decomp.), and $+1{\cdot}5H_2O$, m.p. approx. 256° (decomp.), $[\alpha]_{5461}^{28°}$ −28·2° to −21·0° in H_2O], to be increased to 0·5 g. from 30 litres of human pregnancy urine. Spectrographic examination of (I) and isolation of the Me ether of œstriol (II) from the products of hydrolysis of methylated (I) indicate that the phenolic OH of (II) is free in (I). In adult ovariectomised mice (I) has a potency of 370 mouse units per mg. W. McC.

Effect of œstrogenic hormones on lactation and on the phosphatase of the blood and milk of the lactating cow. S. J. Folley (Biochem. J., 1936, **30**, 2262—2272).—Administration of œstrone and of dihydrofollicular hormone benzoate to lactating cows causes temporary decrease in the milk yield dependent on increase in the amount of œstrogenic hormone in the blood, prolonged increase in the fat and non-fatty solids content of the milk, very great increase, of short duration, in the phosphatase content of the milk, and temporary decrease in the Ca content of the blood-serum but no secretion of colostrum. W. McC.

Δ^5-Androsten-17-ol-3-one.—See A., II, 64.

Uterine response to dihydrotheelin. H. W. Marlow (Science, 1936, **84**, 377).—Dihydrotheelin has a greater effect than theelin on hypertrophy of the uterus. L. S. T.

Preparation from urine of concentrates of follicle-stimulating hormone. E. Brand, R. J. Block, M. M. Harris, and L. E. Hinsie (Proc. Soc. Exp. Biol. Med., 1935, **33**, 360—363).—After adjusting the p_H of the urine to 4·5 the hormone (I) is adsorbed on $Al(OH)_3$ which is then washed with $COMe_2$ and dried. Aq. NaOH at p_H 10—10·5 is used for elution. $\leqslant$60% of (I) is recovered. W. McC.

Progestin in cows' corpora lutea. G. G. Kimura (Proc. Soc. Exp. Biol. Med., 1936, **33**, 97—99).—Fresh cows' corpora lutea contain 14 rabbit units of progestin per kg. as determined in adult castrate female rabbits. Vals. are lower in glands which are not fresh. Fresh sows' corpora lutea give a yield of 30—50 units per kg. P. G. M.

Crystalline progesterone from pig ovaries. W. M. Allen and C. Goetsch (J. Biol. Chem., 1936, **116**, 653—662).—The MeOH extract of the ovaries is diluted with H_2O and extracted with light petroleum (b.p. 55—65°). 25% of the hormone in the tissue can be isolated in the pure state. J. N. A.

Detection and determination of corpus luteum hormone. P. Holtz (Arch. exp. Path. Pharm., 1936, **184**, 74—75).—After 6 injections of follicular hormone into immature guinea pigs (150—160 g.) pro-œstrus–œstrus resulted. This was inhibited when 0·005 mg. of progesterone was simultaneously injected. The method thus detects 0·03 mg. of corpus luteum hormone and is 30 times more sensitive although less sp. than the rabbit test. P. W. C.

Corpus luteum hormone action of placenta extract. C. van Lankeren (Arch. Gynäkol., 1935, **160**, 150—158; Chem. Zentr., 1936, i, 1648). H. J. E.

Hormones of the corpus luteum system. A. von Probstner (Endokrinol., 1935, **16**, 174—179; Chem. Zentr., 1936, i, 1246).—In a case of corpus luteum tumour the cysts contained a considerable proportion of prolan-*B* and little follicular hormone (I). In another case the cyst contained much (I) but no corpus luteum hormone. A. G. P.

Quantitative extraction of sex hormones from urine. T. F. Gallagher, F. C. Koch, and R. I. Dorfman (Proc. Soc. Exp. Biol. Med., 1935, **33**, 440—444).—The male and female hormones are quantitatively removed from normal urines by hydrolysis with HCl for 2 hr. and extraction in a special apparatus with 10 vols. of C_6H_6. The hormones are separated by shaking with aq. NaOH. An alternative procedure for isolating the male hormone by adsorption on diatomaceous earth is described. W. McC.

Gonadotropic substance in urine of normal children. S. C. Freed (Proc. Soc. Exp. Biol. Med., 1936, **33**, 35—36).—Amounts of gonadotropic substance equiv. to those present in the urine of adults are found in the urine of prepubertal children; its properties differ from those of the hormone in postmenopausal urine but resemble those of the hormone of pregnancy urine. P. G. M.

Hormone content of the urine of women during the normal sexual cycle and in amenorrhœa; extraction of the hormone. R. Bompiani and M. David (Rass. Clin. Terap., **32**, 319—348; Chem. Zentr., 1936, i, 1445).—The folliculin content of urine varied considerably in amenorrhœa. Vals. were paralleled by those in serum, and in normal conditions reached max. 9 days after the commencement of menstruation. A. G. P.

Urinary elimination of folliculin. G. Tata (Rass. Clin. Terap., 1935, **34**, 265—270; Chem. Zentr., 1936, i, 1445).—Vals. were low in amenorrhœa but

returned to normal with the reappearance of menstruation. A. G. P.

Activation of male sex hormones. I, II. K. Miescher, A. Wettstein, and E. Tschopp (Biochem. J., 1936, **30**, 1970—1976, 1977—1990).—I. The effects of testosterone (I) on castrated rats are increased, in some cases very greatly, by addition of fatty acids (40 tested), those normal saturated acids with about C_{10} having the least and those with about C_{16} the greatest effects. Saturated or unsaturated OH-acids are usually more effective than are acids without OH. Palmitic acid (II) does not activate *cis*- and *trans*-androsterone and androstanedione: its effect is most pronounced with (I) and similar hormones [*e.g.*, methyltestosterone and androstane-3-*cis*-17-*trans*-diol] which have OH in the 17-*trans*-position and also OH or an αβ-unsaturated CO at 3. Wetting agents and monohydric alcohols activate (I), stearyl being more effective than oleyl. Acid fractions from testes contain in addition to (II) other more effective constituents. The natural activator is possibly a mixture of acids which differ only quantitatively in activating power.

II. Amongst esters of (I) the most effective in promoting growth of the capon's comb are those of the lower fatty acids. The intensity of action decreases rapidly in the higher acids and the effect becomes more prolonged. The palmitate, stearate, and benzoate are almost without effect. In the rat test the activity of the esters of the lower acids greatly exceed that of (I), max. intensity and duration being attained with the esters of $Pr^{\alpha}CO_2H$, $Pr^{\beta}CO_2H$, and $Bu^{\alpha}CO_2H$. The palmitate and stearate are ineffective in rats. The effects of the esters of (I) and androsterone are not, in general, increased by addition of acids although the low activity of (I) acetate in 50% glycerol is increased by ricinoleic acid. It is proposed that, in addition to capon units, rat units should be introduced, that max. effects should be compared independently of time of occurrence, and that duration of effect should be separately characterised. W. McC.

Inhibitory effect of testosterone propionate on experimental prostatic enlargement. S. Zuckerman (Lancet, 1936, **231**, 1259—1262).—Testosterone propionate in sufficient amount inhibits the action of œstrone on the prostate of the rhesus monkey, and is more potent than testosterone, androstanediol, or progesterone. L. S. T.

Chloroketone from male urine.—See A., II, 65.

Sex hormones. XVIII. Preparation of further enol-esters from ketones of the cholestane and androstene series. XIX. Preparation of Δ^5-3-*epi*hydroxyandrosten-17-one.—See A., II, 65.

Effect of zinc and aluminium on the hypoglycæmic action of insulin. J. F. Fazekas and H. E. Himwich (J. Pharm. Exp. Ther., 1936, **58**, 260—263).—The hypoglycæmic action of insulin is prevented by simultaneous injection of $Zn^{\cdot\cdot}$ or $Al^{\cdot\cdot\cdot}$ but not by separate injection or by $Ca^{\cdot\cdot}$ or $Mg^{\cdot\cdot}$. EtOH reduces but prolongs the hypoglycæmia. E. M. W.

Effect of insulin on the course of alimentary hyperglycæmia and hyperalcoholæmia curves. H. Schlichting (Z. ges. exp. Med., 1935, **97**, 60—64; Chem. Zentr., 1936, i, 1447).—Oral administration of EtOH to rabbits increases the blood-EtOH to an extent which is almost as great in insulin (I)-treated as in untreated animals. Simultaneous administration of sugar produces lower vals. in the (I)-treated animals. The subsequent decline in blood-EtOH is more rapid than that in blood-sugar. (I)–sugar treatment of acute EtOH poisoning is indicated. A. G. P.

Absence of thiolhistidine from insulin. V. du Vigneaud, R. H. Sifferd, and G. Miller (Proc. Soc. Exp. Biol. Med., 1935, **33**, 371—373).—The S of thiolhistidine and of zein but not that of cystine, glutathione, methionine, or homocystine is oxidised by Br to inorg. SO_4''. Cryst. insulin before and after hydrolysis with HCl (with or without subsequent reduction) yields no inorg. SO_4'' on oxidation with Br. W. McC.

Distribution of calcium in the brain of normal and thyroparathyroidectomised rats. S. Faragó (Biochem. Z., 1936, **288**, 393—401).—Thyroparathyroidectomy in rats increases [Ca] of the cerebrum and cerebellum but diminishes that of the medulla. Subsequent administration of thyroxine has no effect on the levels but parathyroid preps. produce a return to a more normal distribution although the individual vals. remain > normal. F. O. H.

Endocrines in theory and practice. Chemistry of the thyroid gland. C. R. Harington (Brit. Med. J., 1936, No. 3963, 1269—1271).—A review. A. G. P.

Effect of thyroidectomy on blood-lipins. E. M. Boyd (Trans. Roy. Soc. Canada, 1936, [iii], **30**, V, 11—17).—Sub-total thyroidectomy in man causes an increase in all plasma-lipins, the increase being in the order neutral fat > cholesterol > cholesteryl esters > phospholipins. The increase often is not > the limits of the normal range. There is no increase in the lipin content of the red blood cells. J. N. A.

Effect of dietary fats on the action of thyroid extract. S. Loumos (Proc. Soc. Exp. Biol. Med., 1935, **33**, 424—426).—In rats receiving the extract the rate of loss of wt. is slightly diminished by giving lard but is increased by giving "Crisco." W. McC.

Transference of hormones in milk. S. Konsuloff (Endokrinol., 1935, **16**, 237—240; Chem. Zentr., 1936, i, 1248).—Measurements of CO_2 production by rats indicate that powdered thyroidin administered to the mother is rapidly transferred to the suckling. A. G. P.

Dehydrogenation process in animal tissues after thyroxine treatment. M. Reiss, L. Schwartz, and F. Fleischmann (Endokrinol., 1935, **16**, 145—148; Chem. Zentr., 1936, i, 1446).—Anaërobic dehydrogenation in liver tissue is greater in thyroxine-treated than in normal animals. It is also increased by fasting or fatigue. The effect is ascribed to the formation of donators during mobilisation of glycogen. A. G. P.

Ratio of dehydroascorbic acid to ascorbic acid in tissues after administration of thyroxine. E. Martini and F. Copello (Biochim. Terap. sperim., 1935, **22**, 529—535; Chem. Zentr., 1936, i, 1447).—In livers and adrenals of guinea-pigs dehydroascorbic acid increases and ascorbic acid decreases after thyroxine treatment. Vitamin-*C* and the redox potential of the tissues increase as a result of the greater O_2 consumption. A. G. P.

Tyrosine and thyroxine. I. Abelin (Klin. Woch., 1935, **14**, 1777—1781; Chem. Zentr., 1936, i, 1649).—The antagonistic influence of tyrosine on the physiological action of thyroxine is examined. A. G. P.

Action of thyroxine on heart muscle metabolism. H. Berg (Arch. exp. Path. Pharm., 1936, **184**, 104—105).—The decrease of conductivity of heart muscle after thyroxine treatment is accompanied by fission of adenyl pyrophosphate. P. W. C.

Action of thyroxine on muscle-glycolysis. Fermentable, reducing sugar during glycolysis. P. E. Grégoire (Compt. rend. Soc. Biol., 1936, **123**, 1029—1032).—The increased glycolysis of thyroxinised muscle results in a decrease in the glucose content. H. G. R.

Production of thyroxine by iodination of protein.—See A., II, 40.

Multiple nature of the growth hormone. R. W. Bates, T. Laanes, and O. Riddle (Proc. Soc. Exp. Biol. Med., 1935, **33**, 446—450).—The growth of dwarf mice is promoted by desiccated thyroid, prolactin, and thyrotropic hormone, the last two exhibiting synergism. The growth hormone is probably not a single substance. W. McC.

Vitamin deficiency, infection, and prevention of disease. L. Oelrichs (Z. Hyg., 1935, **117**, 684—710; Chem. Zentr., 1936, i, 1251). A. G. P.

Vitamin-*A* and carotene. XIII. Vitamin-*A* reserve of the adult human being in health and disease. T. Moore. **XIV. Vitamin-*A* reserves of the human infant and child in health and disease.** J. B. Ellison and T. Moore. **XV. Influence of vitamin-*A* reserve on the length of the depletion period in the young rat.** A. W. Davies and T. Moore. **XVI. Effect of the administration of large amounts of vitamin-*A* on the vitamin-*A* content of the hen's egg.** E. M. Cruickshank and T. Moore (Biochem. J., 1937, **31**, 155—164, 165—171, 172—178, 179—187).—XIII. The vitamin-*A* content of adult human liver varies widely in health; the median val. was 220 international units per g. of wet tissue. Lower median vals. were obtained in groups representing a wide range of diseases.

XIV. The -*A* content of the liver is very low at birth, rises sharply in the earliest months, and is then static through childhood. The median val. in health was 140 international units per g. but lower in various diseases.

XV. Rats fed after weaning on an -*A*-rich diet showed high liver reserves, falling steadily on a vitamin-deficient diet over a long period through which growth was maintained. A group on vitamin-poor diet had low reserves, disappearing rapidly with rapid cessation of growth. Growth and positive liver reactions reappeared on giving halibut-liver oil. The reality of vitamin storage is demonstrated although its relation to the period of survival on a deficient diet is only qual.

XVI. Copious addition of the vitamin to ordinary diet gave some increase in -*A* content of the yolk and enormous accumulation in the hen's body. The yolk content fell to normal on return to normal supply; the body stores fell more slowly. -*A* accumulates in the kidney but < in the liver. R. M. M. O.

Seasonal variations of the vitamin-*A* reserve and the motor chronaxie in guinea-pigs. A. Chevallier, Y. Choron, and L. Espy (Compt. rend. Soc. Biol., 1936, **123**, 909—910).—In spring, when there is a vitamin-*A* reserve in the liver, the chronaxie val. is > that in the autumn when the reserve is lower. H. G. R.

Vitamins and catalysts in wheat embryos. H. von Euler and M. Malmberg (Arkiv Kemi, Min., Geol., 1936, **12**, **B**, No. 14, 6 pp.).—Wheat embryo is rich in fat-sol. growth-promoting factors. The vitamin-*A* content is < that required to bring about the growth observed. Dehydrogenases in the embryo belong mainly to the class requiring flavin-enzyme and cozymase for their action. E. A. H. R.

Vitamin-*B* complex. R. A. Peters (Brit. Med. J., 1936, No. 3957, 903—905).—A review. A. G. P.

Enzymic efficiency in avitaminosis. B. Sure, M. C. Kik, and K. S. Buchanan (Proc. Soc. Exp. Biol. Med., 1936, **33**, 78—80).—In vitamin-*B* deficiency there is a decrease in pancreatic lipase (I) and esterase (II) and an increase in serum-phosphatase. In -*A* deficiency a decrease in serum-(II) is accompanied by an increase in liver-(I). No disturbance of protein or starch digestion occurs in either -*A* or -*B* deficiency. P. G. M.

Biological methods for vitamin-*B* complexes. C. A. Elvehjem (J. Assoc. Off. Agric. Chem., 1936, **12**, 595—598; cf. *ibid.*, 1935, **18**, 354).—The method described previously gives uniform results in the hands of different workers. Chicks are sensitive to differences of 0·25% of yeast in the ration. E. C. S.

Blood-alcohol curve and experimental beri-beri. A. Galamini (Atti R. Accad. Lincei, 1936, [vi], **23**, 623—626).—Ingestion of EtOH by pigeons suffering from *B*-avitaminosis produces an increased blood-EtOH level for periods > that with normal birds. F. O. H.

Pyruvic acid oxidation in brain. I. Vitamin-B_1 and the pyruvate oxidase in pigeon's brain. R. A. Peters (Biochem. J., 1936, **30**, 2206—2218).—Review of previous data together with fresh evidence lead to the view that lactate is directly oxidised to pyruvate (I) in pigeon's brain, and that the action of vitamin-B_1 is specifically related to the further oxidation of (I). The two oxidase systems can be separated at acid reactions, and -B_1 and (I) are necessary to ensure stability of (I) oxidase at p_H 6·6. F. A. A.

Resorption of vitamin-*B* in the small intestine. A. SCHEUNERT and M. SCHIEBLICH (Ber. Verh. sächs. Akad. Wiss., math.-phys. Kl., 1935, **87**, 179—184; Chem. Zentr., 1936, i, 1650).—Vitamin-B_1 is readily resorbed (66%) from dried or living yeast cells in the small intestine. -B_2 is similarly resorbed. A. G. P.

Vitamin-B_1 and thyroxine. B. SURE and K. S. BUCHANAN (Proc. Soc. Exp. Biol. Med., 1936, **33**, 77—78).—75—100% of normal growth was obtained on a daily dose of 0·05 mg. thyroxine (I) with administration of 7·5—15 Sherman units of -B_1 concentrate. With a daily dose of 0·2 mg. of (I) loss of wt. was prevented by 30 units of -B_1, but little growth took place. Less growth was obtained with higher doses of cryst. vitamin. P. G. M.

Avitaminosis. XVII. Influence of high-fat diets on vitamin-B_1 requirements. B. SURE and K. S. BUCHANAN (Proc. Soc. Exp. Biol. Med., 1936, **33**, 75—76).—High-fat diets do not reduce the amount of vitamin-B_1 required even with an ample supply of -B_2 and protein (cf. A., 1935, 415). P. G. M.

Detection and determination of vitamin-B_1. H. J. PREBLUDA and E. V. MCCOLLUM (Science, 1936, **84**, 488).—Vitamin-B_1 and the product obtained by the action of HNO_2 on *p*-amino-acetanilide or -acetophenone gives a characteristic, stable, purple-red compound insol. in H_2O. L. S. T.

Determination of aneurine (vitamin-B_1) by the thiochrome reaction. B. C. P. JANSEN (Rec. trav. chim., 1936, **55**, 1046—1052).—Aneurine hydrochloride (I) in 0·1 ml. of H_2O is shaken with 0·1% aq. $K_3Fe(CN)_6$ [0·01—0·1 ml. for 1, 0·03—0·1 ml. for 10, or 0·1—0·2 ml. for 20×10^{-6} g. of (I)], 3 ml. of 10% NaOH are added, and after 1—2 min. the solution is extracted with 13 ml. of Bu$^{\beta}$OH and centrifuged. The thiochrome (II) in the Bu$^{\beta}$OH layer is determined by measuring the fluorescence photo-electrically. Conversion of (I) into (II) is nearly quant. The amount of $K_3Fe(CN)_6$ taken has less influence in MeOH, and reaction in MeOH instead of H_2O thus gives better results in certain cases. R. S. C.

Oxygen uptake and composition of skin of rats in vitamin-B_2 deficiency. P. A. ADAMS (J. Biol. Chem., 1936, **116**, 641—651).—The O_2 consumption falls to a much lower level than in normal rats of the same age. The difference is not caused by inanition. O_2 uptake per mg. of phospholipin (I) of skin also falls. The total fat content diminishes, whilst the (I) content slightly increases. J. N. A.

Influence of vitamins on the water-affinity of blood. I. Ascorbic acid. J. FLIEDERBAUM and R. TISCOWITZ (Z. ges. exp. Med., 1935, **97**, 121—126; Chem. Zentr., 1936, i, 1651).—Intravenous administration of ascorbic acid increases the colloid-osmotic pressure in dog blood, and corrects the lowered pressure resulting from experimental adrenal insufficiency. A. G. P.

Anaphylactic shock and vitamin-*C*. A. HOCHWALD (Z. ges. exp. Med., 1935, **97**, 433—439; Chem. Zentr., 1936, i, 1451).—Injection of ascorbic acid 2 hr. before shock treatment eliminates the shock. Glutathione acts similarly. Histamine-shock was not affected. A. G. P.

Relationship of vitamin-*C* to glucose tolerance in the guinea-pig. A. SIGAL and C. G. KING (J. Biol. Chem., 1936, **116**, 489—492).—The fasting blood-sugar level in guinea-pigs is increased, and the glucose tolerance lowered, by 10 days of vitamin-*C* depletion. Re-administration of -*C* is followed by a return to normal, within 15 days. F. A. A.

Biological oxidations. VII. Oxidation of ascorbic acid in biological fluids. E. S. G. BARRON, A. G. BARRON, and F. KLEMPERER (J. Biol. Chem., 1936, **116**, 563—573).—Fluids of animal origin, and those of vegetable origin which contain considerable amounts of ascorbic acid (I), protect (I) against oxidation. This is due to the presence in them of glutathione, proteins, or NH_2-acids, which form complexes with Cu, and hence inhibit catalysis by Cu$^{\cdot\cdot}$. Hæmochromogens also catalyse the oxidation of (I); this reaction is inhibited by CN$'$. F. A. A.

Seasonal variations in the ascorbic acid content of the organs of the frog. E. NESPOR (Compt. rend. Soc. Biol., 1936, **123**, 928—929).—The ascorbic acid content of the various organs of frogs kept under laboratory conditions from October to April is < that of those collected in March. H. G. R.

Relations between diet and urinary output of thiosulphate (and ascorbic acid). Human requirements for vitamin-*C*. M. HEINEMANN (Biochem. J., 1936, **30**, 2299—2306).—The total reducing capacity of urine rises and falls with the protein intake and depends chiefly on the S_2O_3'' output. Cystine taken with a low-protein diet has the same effect on the urinary reducing capacity as have high protein diets. If the urinary ascorbic acid (I) output is determined, however, after pptn. with $Hg(OAc)_2$ its amount is not influenced by the proportion of the dietary protein. The daily requirement of (I) for man is 60 mg. for a body-wt. of 70 kg. An essentially smaller amount is, however, sufficient to prevent scurvy. P. W. C.

Relation between body-weight of pigs and ascorbic acid, cathepsin, and amylase content of liver. G. SCOZ and L. DE CARO (Enzymologia, 1936, **1**, 199—208).—The rate of increase in body-wt. of normal, fasting, and thyroxine- and di-iodotyrosine-treated pigs ∝ the ascorbic acid content of the liver. Catheptic activity is min. and amylolytic activity is max. with a normal growth rate. E. D. Y.

Vitamin-*C* requirement of mice, and its biological formation. I. S. KLEINER and H. TAUBER (Food Res., 1936, **1**, 399—404).—Growth is retarded by oral administration of large quantities of ascorbic acid (I) (10% of the diet), although more food is consumed. Mice on a diet containing 0·1% of (I) grow better than those on a (I)-deficient diet. Neither extracts of rat and beef tissues nor various moulds, *B. xylinum*, etc. can convert sugars into (I). P. G. M.

Vitamin-*C* studies in the rat and guinea-pig. J. L. SVIRBELY (J. Biol. Chem., 1936, **116**, 543—

553).—Feeding with salts of Cu, Be, Pb, As, Hg, Cd, Co, Mn, Th, or UO_2 does not prevent synthesis of vitamin-*C* in the rat. The body contains a protective mechanism preventing catalytic oxidation of -*C* by Cu. Org. compounds are likewise without effect, except those containing halogen. Vals. are given of the relative wts. of, and the concns. of -*C* in the liver and gut under the above conditions. A high-Na diet does not affect the survival time or scorbutic symptoms of guinea-pigs deprived of -*C*. F. A. A.

Synthesis of ascorbic acid by the human fœtus. A. Giroud, R. Ratsimamanga, M. Rabinowicz, A. S. Ruiz, and I. Cesa (Compt. rend. Soc. Biol., 1936, **123**, 1038—1040).—The ascorbic acid content of the 3—4 months fœtus is > that at term. H. G. R.

Ascorbic acid content of the ovary and corpus luteum at various stages of the œstrous cycle. A. A. Policard and M. Ferrand (Compt. rend. Soc. Biol., 1936, **123**, 1081—1084).—The ascorbic acid content of the corpus luteum runs parallel with the physiological cycle and is a max. 8—15 days after ovulation. H. G. R.

Vitamin-*C* content of the human tonsil. M. M. Clayton and J. D. Keith (Science, 1936, **84**, 377—378).—The vitamin-*C* content of 54 persons, mainly children, ranged from 10·6 to 47·6 mg. per 100 g. of tissue. The -*C* contents of diet and tonsils appear to be related. L. S. T.

Vitamin-*C* content of the ejaculate of the guinea-pig. D. Zimmet and P. Sauser-Hall (Compt. rend. Soc. Biol., 1936, **123**, 584—586).—The ejaculate contains approx. 0·054 mg. per g. Reduced glutathione is absent. H. G. R.

Storage of ascorbic acid in organs of guinea-pigs after ingestion of the crystalline acid with a vitamin-*C*-free diet. E. Jacobsen (Skand. Arch. Physiol., 1935, **72**, 259—264; Chem. Zentr., 1936, i, 1451).—Rates of storage of ascorbic acid after feeding the cryst. acid to -*C*-depleted animals are examined. A. G. P.

Amount of ascorbic acid in blood and urine. Daily human requirements for ascorbic acid. M. van Eekelen (Biochem. J., 1936, **30**, 2291—2298).—Curves showing the variation of ascorbic acid (I) content of blood and urine in a normal man under various conditions are given. Saturation of the organism with (I) coincides with a kidney threshold val. of 0·0013%. The daily dose required by adults weighing 70 kg. is about 60 mg. under normal conditions. P. W. C.

Urinary excretion of ascorbic acid in the dog following ether anæsthesia. D. E. Bowman and E. Muntwyler (Proc. Soc. Exp. Biol. Med., 1935, **33**, 437—438).—Excretion is increased following Et_2O anæsthesia. W. McC.

Vitamin-*C* in pasteurised milk. P. F. Sharp (Science, 1936, **84**, 461—462).—Pasteurisation for 30 min. at 62—63° (holder method) causes slight destruction of the enzyme which oxidises ascorbic acid (I) and satisfactory bacterial destruction without injuring creaming ability. Heating at 77° for >0·5 min. destroys the enzyme and creaming ability. Milk can be pasteurised by the holder method and maintain essentially as high a (I) content as that of raw milk of the same age. Contamination with Cu must be avoided. By using higher temp. it is possible to produce pasteurised milk which when kept will have a (I) content > of raw milk of the same age. L. S. T.

Effect of light on the vitamin-*C* of milk. S. K. Kon and M. B. Watson (Biochem. J., 1936, **30**, 2273—2290).—Milk giving a positive test for ascorbic acid (I) fails to reduce indophenol reagent after exposure to daylight through glass. The reducing power is restored to a varying extent by treatment with H_2S but irreversible losses occur. Short-λ light (blue, violet) is chiefly responsible for the reaction; yellow or red light is without action and ultra-violet light is probably active. The effect is not obtained in the absence of O_2. Dehydroascorbic acid is formed in the reversible oxidation and the lactone ring is opened in the further irreversible changes. Synthetic (I) added to milk behaves in the same way. Tests on guinea-pigs shows that the substance produced in the reversible oxidation is biologically active but those in the irreversible reaction are inactive. Pasteurisation destroys the reversibly oxidised, but does not affect the reduced form of, (I). Milk secreted by normal cows contains only reduced (I) and the amount of destruction of (I) by pasteurisation depends on the previous exposure of the milk to light. P. W. C.

Biosynthesis of ascorbic acid. B. C. Guha and B. Ghosh (Nature, 1936, **138**, 844—845).—The increase in ascorbic acid content which results when rat tissue or an aq. extract of germinated *Phaseolus mungo* is incubated with mannose in a closed vol. of air (A., 1935, 131, 416, 903) has been confirmed. In N_2 the increase does not occur, which explains the negative results of Euler *et al.* (A., 1936, 255). L. S. T.

State of ascorbic acid in plant tissues. L. F. Levy (Nature, 1936, **138**, 933; cf. A., 1936, 1429).—Determinations of ascorbic acid (I) in cauliflower and potato after extraction in several ways support the view that (I) exists partly in a combined state and is liberated during boiling. On the other hand, oxidases are active during boiling and reduce the amount of (I). L. S. T.

Vitamin-*C* in vegetables. IV. Ascorbic acid oxidase. Z. I. Kertesz, R. B. Dearborn, and G. L. Mack (J. Biol. Chem., 1936, **116**, 717—725).—Ascorbic acid oxidase (I) is generally present in vegetables, and is completely inactivated by heating at 100° for 1 min. Losses of physiologically active forms of ascorbic acid (II) are caused by its enzymic oxidation to dehydroascorbic acid, which is more readily decomposed than is (II) to compounds having no antiscorbutic activity. More (II) is retained in vegetables if the (I) is destroyed by heat. As (I) and catalase (III) are inactivated by heat at the same rate, the extent of inactivation of (I) can be determined by measuring the (III) activity. E. A. H. R.

Factors influencing ascorbic acid content of apples. E. N. Todhunter (Food Res., 1936, **1**, 435—442).—Apples contain 0·5—1·5 international units of ascorbic acid (I) per g., which they lose slowly on storage at >0°. The skin contains more (I) than the pulp. Titration with 2 : 6-dichlorophenol-indophenol gives similar results to the biological method on the whole fruit, but lower results on the pulp. P. G. M.

Metabolism of ascorbic acid in the apple fruit. S. S. Zilva, F. Kidd, and C. West (Rep. Food Invest. Bd., 1935, 110—111).—In young apples a great part, if not all, of the ascorbic acid is present in the reversibly oxidised form. E. C. S.

Rôle of vitamin-*C* in the growth of higher plants. S. von Hausen (Biochem. Z., 1936, **288**, 378—392; cf. A., 1936, 391).—The formation of vitamin-*C* in plants (peas, clover) is favoured by adequate provision of N, either from NO_3' or root nodule-bacteria, and by optimal [K^+] (0·025% of KCl) and [PO_4'''] [0·025% of $Ca_3(PO_4)_2$]. Addition of -*C* to culture solutions, especially before formation of leaves, increases the dry-wt., growth, and -*C* content of plants; the action is sp. for -*C* and does not occur with glucose. Pea-seeds, germinated for 7 days and stripped of their cotyledons, produce leaves only after treatment with -*C*. F. O. H.

Vitamin-*C*. XVIII. Effect of light in its production. T. Matsuoka (J. Agric. Chem. Soc. Japan, 1936, **12**, 1203—1210).—Light is not essential for but greatly increases the production of vitamin-*C* in growing plants. E. M. W.

Determination of ascorbic acid as furfuraldehyde and comparison of results obtained by this method and by indophenol titration. J. H. Roe (J. Biol. Chem., 1936, **116**, 609—619).—The method, which can be used for plant and animal tissues, consists in the determination of the furfuraldehyde (I) (colorimetrically with NH_2Ph in presence of $SnCl_2$ and AcOH) formed by boiling an acid extract of the tissue [in which the ascorbic acid (II) has been oxidised by treatment with C] with HCl alone and with HCl–$SnCl_2$. The difference between the two vals. gives the amount of (I). The method gives results in agreement with the indophenol titration, except in the case of liver where the latter method gives results 25% higher. In all tissues examined, (II) exists in the reduced form only. The method is highly sp. J. N. A.

Antiscorbutic properties of methyl 2-ketogluconate. A. E. Siehrs, P. Gottardo, F. G. Brazda, and C. O. Miller (Proc. Soc. Exp. Biol. Med., 1935, **33**, 422—423).—Me 2-ketogluconate (20—100 mg. daily) protects guinea-pigs against scurvy and 50—100 mg. per day cures them. W. McC.

Pro-vitamin-*D* potency of some sterol derivatives. E. M. Koch and F. C. Koch (J. Biol. Chem., 1936, **116**, 757—768).—The contaminant of spinal cord-cholesterol (I) which has four absorption bands is probably 7-dehydrocholesterol (II) (cf. A., 1936, 120). The provitamin-*D* of heated, purified (I) is not (II) as it remains after the elimination of the four bands. The two double linkings in ring B are not alone responsible for antirachitic activity, the presence and configuration of side groups also influencing the potency. In the prep. of (II) according to Windaus *et al.* (A., 1935, 1363), two other products having antirachitic activity were obtained differing from (II) in m.p. and [α]. E. A. H. R.

Pro-vitamin of the sterol of eggs. A. Windaus and O. Stange (Z. physiol. Chem., 1936, **244**, 218—220).—Cholesterol from dried Chinese egg-yolks contains small amounts of ergosterol (I) separated by repeated adsorption on Al_2O_3. (I) is probably derived from the food of the hens. W. McC.

Enrichment of vitamin-*D* from tunny-liver oil. O. Neracher and T. Reichstein (Helv. Chim. Acta, 1936, **19**, 1382—1391).—Methods, involving partition, adsorption, and reaction with o-$C_6H_4(CO)_2O$ for obtaining rapidly concentrates containing 20% of vitamin-*D* are detailed. These concentrates afford *dinitrobenzoates*, (*a*) $C_{27}H_{40}O_7N_2$, m.p. 202° (corr.), (*b*) $C_{27}H_{33}O_6N_2$, m.p. 181·5—182·5° (corr.), and (*c*), m.p. 113°; these can be hydrolysed only by Na_2SnO_2; the resultant alcohols are physiologically inactive. R. S. C.

Single-dose technique for the assay of vitamin-*D*. R. L. Edwards (Chem. and Ind., 1936, 983; cf. this vol., 46).—The healing of rickets in rats on Steenbock's diet 2965 following the administration of a single dose of vitamin-*D* increases rapidly to a max. in 10 days, and then declines. Rats receiving the same total of -*D* as 10 daily doses continue healing at least until the 14th day; on the 7th—10th days, healing by the two methods is about the same, which probably explains the results obtained by Coward and Key (A., 1934, 931). F. A. A.

Biological methods for assay of vitamin-*D* carriers. W. B. Griem (J. Assoc. Off. Agric. Chem., 1936, **19**, 585—588).—Four weeks' feeding is sufficient to demonstrate vitamin-*D* deficiency in chicks by the tibia ash method. The protective dose is ≯27 U.S.P. units of -*D* from cod-liver oil per 100 g. of basal ration. E. C. S.

Biological methods for vitamin-*D* carriers. L. L. Lachat (J. Assoc. Off. Agric. Chem., 1936, **19**, 598—602).—In determining the % of bone ash a standardised analytical procedure must be strictly adhered to. E. C. S.

Determination of vitamin-*D*. V. *X*-Ray diagnosis and ash determination of bone calcification, and blood mineral analyses in White Leghorn chicks. H. A. Halvorson and L. L. Lachat. **VI. Comparative vitamin-*D* requirement of the chick for sardine (pilchard), concentrated, and cod-liver oils, irradiated yeast, irradiated ergosterol, and irradiated cholesterol.** L. L. Lachat and H. A. Halvorson. **VII. Effect of age, sex, size, and calcification in young chicks on accuracy of preventive bioassay.** L. L. Lachat (J. Assoc. Off. Agric. Chem., 1936, **19**, 628—637, 637—646, 647—670; cf. A., 1936, 1430).—V. The % Ca and Mg of blood-plasma do not vary consistently, and the % inorg. P varies only slightly, with the age of the chick and the amount or kind

of vitamin-*D* supplement used. Of the methods examined, determination of the ash of the tibia is most satisfactory, and by this means deficiency of -*D* can be detected in 2 weeks (cf. preceding abstract).

VI. Irradiated cholesterol and U.S.P. reference cod-liver oil are equal in promoting growth and bone calcification when 28 U.S.P. units of -*D* from each per 100 g. of A.O.A.C. ration per chick are fed for 4 weeks, but irradiated ergosterol and irradiated yeast fail to produce a normally calcified bone even at 50 times this activity. Irradiation for 20 min. of A.O.A.C. ration supplemented with maize oil produces definite, but slightly subnormal, calcification.

VII. The data obtained from >2000 chicks are examined statistically. Deficiency of -*D* was more marked in respect of calcification than of growth, but determination of the latter has a supplementary val. Calcification did not decrease with deficiency of -*D* until the chicks were 3 weeks old, but, with sufficient vitamin, increase occurred before this age. Differences in calcification were most pronounced at 3 and 4 weeks. The test period may be reduced from 4 to 3 weeks. E. C. S.

Deficiency diet for investigation of vitamin-*E*. L. Schioppa (Ann. Igiene, 1935, **45**, [N.S. **18**], 315—319; Chem. Zentr., 1936, i, 1653). A. G. P.

Nutritional requirements of mosquito larvæ (*Aedes aegypti*). W. Trager (Amer. J. Hyg., 1935, **22**, 475—493).—Two accessory food substances are necessary for the yellow-fever mosquito. One is present in aq. extracts of yeast and in egg white and whole wheat. It is stable to heat and alkali and is not adsorbed by fullers' earth. The second is found in liver extracts rich in vitamin-B_2, is decomposed by alkali, is thermostable, and adsorbed by fuller's earth and animal C at p_H 5—7. Liver extracts potent against secondary anæmia but poorly effective against pernicious anæmia contain the second accessory substance. Ch. Abs. (*p*)

Elaboration of carbonaceous matter by plants in an aqueous medium. M. T. Gertrude (Compt. rend., 1936, **203**, 811—813).—Photosynthesis in *Veronica anagallis* was more active in plants grown under H_2O than in those in air. Elaboration of carbonaceous matter was substantially the same in both cases. A. G. P.

Plant nucleoli. G. Yamaha and S. Suematsu (Sci. Rep. Tokyo Bunrika Daigaku, 1936, **3**, 21—34).—Nucleoli bear a negative charge. Changes in the nucleal reaction of the various elements of the nucleus and the distribution of nucleic acid during karyokinesis are examined. A. G. P.

Absorption by roots. P. Mazé and P. J. Mazé, jun. (Compt. rend. Soc. Biol., 1936, **123**, 939—941).—Absorption is ionic and the rate depends on the nature of the ionic charge. H. G. R.

Structure of the wall of algæ of the genus *Halicystis*. G. van Iterson, jun. (Proc. K. Akad. Wetensch. Amsterdam, 1936, **39**, 1066—1074).—The wall consists of substances showing the reactions of amyloid matter and callose. A. G. P.

Importance of ash elements in the cultivation of excised root tips. W. J. Robbins, V. B. White, J. E. McClary, and M. Bartley (Proc. Nat. Acad. Sci., 1936, **22**, 636—639).—The beneficial effect of additions of agar or filter-paper on the growth of excised tips in mineral salt–glucose media is attributable to their ash constituents. A. G. P.

Mathematical expression of equilibrium between nitrogen and phosphoric acid in plants. W. Thomas (Science, 1936, **84**, 422—423).—Deviations from the optimum physiological balance between N and P_2O_5 in four differently treated plots are shown and discussed. L. S. T.

Photochemical oxidation of plant materials. S. V. Desai and Fazal-ud-din (Indian J. Agric. Sci., 1936, **6**, 985—990).—Dried and powdered berscem plants (*Trifolium alexandrinum*) catalysed the photo-chemical oxidation of NH_2Et to NO_2', the action being unaffected by preheating the plant material to 125°. The catalytic principle was present to a greater extent in leaves and roots than in stems and was almost entirely H_2O-sol. Fructose, glucose, maltose, cryst. and amorphous preps. of chlorophyll, but not crude fibre, cotton cellulose, or starch catalysed the reaction. CO_2 retarded the photo-oxidation of $(NH_4)_2SO_4$ in the presence of ZnO. The temporary increase in the NO_2' content of grass following fertilisation with $(NH_4)_2SO_4$ (Eggleton, A., 1935, 1037) may be due to photo-oxidation of $NH_4^{\cdot}$ within the plants. A. G. P.

Photochemical processes in biology. I. Principal photochemical reactions and their reaction mechanisms. G. de Toni (Biochim. Terap. sperim., 1935, **22**, 547—555; Chem. Zentr., 1936, i, 1438).—A general survey. H. N. R.

Influence of temperature treatment on carbohydrate metabolism, respiration, and morphological development of the tulip. III. L. Algera (Proc. K. Akad. Wetensch. Amsterdam, 1936, **39**, 1106—1114; cf. this vol., 48).—Relative changes in concns. of reducing and non-reducing sugars in bulbs during cool storage and after planting are explained by a shifting of the equilibrium of enzymic processes with temp. A. G. P.

(A) Respiration and water content of seeds. R. Gane. **(B) Uptake of water by grains of maize.** A. J. M. Smith. **(C) Water relations of pea seeds.** A. J. M. Smith and R. Gane (Rep. Food Invest. Bd., 1935, 135—137, 137—138, 138—139).—(A) The respiration of soaked peas and wheat grains reaches a steady val. after 24 hr. This val. increases with the H_2O content of the seed from 0·25 mg. of CO_2 per kg. per hr. (15°) to 250 mg. in the fully-soaked seed.

(B) The H_2O content of seeds is adjusted to various levels by soaking to equilibrium in aq. LiCl of varying concn.

(C) Peas dried over $CaCl_2$ to zero H_2O content and so stored were superior in colour and in their capacity to take up H_2O to commercial air-dried peas. They did not, however, soften so readily on cooking. E. C. S.

Effect of folliculin on plants. C. Zollikofer (Ber. deut. bot. Ges., 1936, **54**, 507—516).—Treatment of *Poa alpina* var. *intermedia* with cryst. folliculin improved flowering and tillering. Complete nutrients in H_2O cultures induced similar effects. A. G. P.

Occurrence and transport of a substance causing flowering in soya bean (*Glycine max.*, L.). J. Kuijper and L. K. Wiersum (Proc. K. akad. Wetensch. Amsterdam, 1936, **39**, 1114—1122).—Grafting a flowering scion on a "long-day" stock (*i.e.*, with no tendency to flower) causes lateral flower buds to develop on the stock. A "short-day" stock causes flowering on a "long-day" scion. The active substance concerned passes through the graft. Transport is more rapid in a basal than in an apical direction. A. G. P.

Growth hormones in plants. M. M. Janot (Bull. Soc. Chim. biol., 1936, **18**, 1741—1768).—A lecture.

Growth-substance and plagiotropic movement in *Parthenocissus*. W. Zimmermann (Ber. deut. bot. Ges., 1936, **54**, 496—506).—The curvature of the growing tips of vine shoots is related to the differential distribution of growth-substance and is dependent on the cross-sectional polarity of the shoot. A. G. P.

Growth-substance curvatures of *Avena* in light and dark. J. van Overbeek (J. Gen. Physiol., 1936, **20**, 283—309).—Growth-substance curvatures of *Avena* coleoptiles show that a decrease in growth rate follows exposure to light if auxin-*A*, but not if heteroauxin, is used. This is due to the more rapid oxidative inactivation of auxin-*A*. Small amounts of light markedly inhibit the formation of growth hormone in the decapitated coleoptile. F. A. A.

Stimulation of root-formation on lucerne cuttings. G. W. Burton (J. Amer. Soc. Agron., 1936, **28**, 704—705).—Naphthylacetic acid was superior to indolylacetic acid in stimulating the formation of adventitious roots on cuttings. Tip cuttings formed more roots than those taken lower down the stem, whether these were treated or not. Excessive amounts of the growth-substance injured the cuttings. A. G. P.

Nature and control of potato virus diseases. P. A. Murphy (Nature, 1936, **138**, 955—956). L. S. T.

Chemical composition of non-manured mulberry leaves. K. Suda (Bull. Sericult. Japan, 1936, **9**, 77—84).—The H_2O and protein contents and Et_2O extract of non-manured mulberry leaves were < and the sol. N-free extract and carbohydrate, and crude fibre and ash were > those of manured trees. E. M. W.

Chemical constituents of food plants for true and wild silkworms, *Bombyx mori*, *Antheraea Yamamai*, and *A. pernyi*. T. Nakasone and Y. Midorikawa (Bull. Sericult. Japan, 1936, **9**, 69—76).—The food plants of domesticated and wild silkworms differ considerably in H_2O, sugar, and protein content. E. M. W.

Distribution of calcium, phosphorus, and iron in leafy vegetables. C. F. Wang (Chinese J. Physiol., 1936, **10**, 651—656).—Data are given for the distribution of Ca, Fe, and P in 11 kinds of vegetables grown in the Moukden district. The content of Ca, Fe, or P in spring is > that in autumn (cf. Hsü and Adolph, A., 1935, 797). F. A. A.

Determination of the internal gases of plant tissues. C. W. Culpepper, H. H. Moon, and J. M. Lutz (Science, 1936, **84**, 398—400). L. S. T.

Bismuthate method for determining manganese in plant material. R. Narain and A. Singh (Indian J. Agric. Sci., 1936, **6**, 757—766).—The gravimetric method for Mn often yields high results in analysis of plant materials. The volumetric Na bismuthate method is satisfactory for HCl-extracts of plant ash. Accuracy is improved by use of HNO_3 carefully freed from nitrous fumes, and by removal of all traces of HCl before oxidation. Removal of H_2SO_4 prior to oxidation is unnecessary. A. G. P.

Determination of ammonia in green plants. F. Alten, B. Wandrowski, and E. Knippenberg (Bodenk. Pflanzenernähr., 1936, **2**, 120—125).—NaOH and $Ba(OH)_2$ decompose NH_2-acids and acid amides in plant material during distillation of NH_3. A borate buffer which on dilution (1 : 2—3) has p_H 9·0 is suitable for liberating NH_3. Loss of NH_3 accompanies pptn. of protein from plant saps by tannin. Ground fresh plant tissue mixed with H_2O and stored in an ice chamber gives a quant. yield of NH_3 on subsequent analysis. Ground plant material treated with PhMe may be stored in ice for several days without decomp. Plants dried at 55° give high and those at 110° low results in NH_3 determinations. A. G. P.

Determination of the nitrate contents of plant substances as nitroxylenol. F. Alten, B. Wandrowsky, and E. Hille (Bodenk. Pflanzenernähr., 1936, **1**, 340—348).—The method of Treschow and Gabrielsen (B., 1934, 112) can be utilised for 1-g. samples of plant materials, if the nitration is effected at room temp. with 25 c.c. of 66% H_2SO_4. After 20 min. the mixture is diluted with 60 c.c. of H_2O and 45 c.c. of the liquid are distilled into 0·2*N*-NaOH. The distillate may be clarified by shaking with $BaSO_4$. A correction for colouring matter other than nitroxylenol which may appear in the distillate is determined from a "blank" test in which xylenol is omitted. A. G. P.

Ethereal oils of the rhizomes of *Languas* (*Alpinia*) varieties. A. J. Ultée (Rec. trav. chim., 1936, **55**, 993—999).—The rhizomes of (*a*) *L.* (*A.*) *Romburghiana*, Val., (*b*) *L. Schumanniana*, Sasaki (*A. Schumanniana*, Val.), and (*c*) *L. speciosa*, Small (*A. speciosa*, K. Sch.), gave 0·08, 0·08, and 0·13%, respectively, of oils, d^{16} 0·9759, d^{18} 0·9365, d^{19} 0·9221; n_D^{16} 1·5152, n_D^{18} 1·4782, 1·4740; $[\alpha]_D^{16}$ +8·4°, $[\alpha]_D^{18}$ +46·24°, $[\alpha]_D^{19}$ −10·51°, acid val. 2, 9, 1; ester val. 137, 38, 27; sap. val. 139, 47, 28, respectively, containing (*a*, *b*, *c*) *l*-α- and *l*-β-pinene; (*a*, *b*) *d*-camphene; cineole (*a*) 9·7, (*b*) 0, (*c*) 60·2; *d*-camphor (*a*) 6·3, (*b*) 31·7, (*c*) 0, *d*-borneol (*a*) 12·9, (*b*) 12·5, (*c*) 0, and Me cinnamate (*a*) 40, (*b*) 0, and (*c*) 7·8%, respectively. R. S. C.

Chemical nature of citrin. V. Bruckner and A. Szent-Györgyi (Nature, 1936, **138**, 1057).—Citrin (I) (A., 1936, 1162) consists of hesperidin (II) with an eriodictoyl glucoside in minor amount. The reactivity and colour reactions of (I) are due to the latter. (I) contains no free eriodictoyl. Eriodictoyl glucoside is not found in any large amount in unripe oranges, which, however, contain large amounts of (II), indicating that the glucoside is formed from (II) by demethylation on ripening of the fruit. L. S. T.

Glutathione in wheat germ. B. Sullivan, M. Howe, and F. D. Schmalz (Cereal Chem., 1936, **13**, 665—669).—0·4605% of glutathione (I) was found in wheat germ. H_2O extract of germ, (I) from germ, and (I) from yeast had similar bad effects on the farinogram of patent flour. Oxidising agents check this action by converting the ·SH of reduced (I) into ·S·S·. Any change affecting the oxidation–reduction potential of flour will modify the gluten. E. A. F.

Phosphatides in organs containing chlorophyll. B. Rewald (Biochem. Z., 1936, **289**, 73—75).—The earlier method of prep. (A., 1929, 361) is improved. Lucerne contains a phosphatide, having a P content of 4·92%, in combination with a polysaccharide. P. W. C.

Starch isolated from plant material by the freezing method. H. A. Spoehr and H. W. Milner (J. Biol. Chem., 1936, **116**, 493—502).—The freezing method described previously (A., 1936, 124) effectively separates starch from pectin, gum arabic, and glucose, but dextrin may be carried down. The amount of dextrin in the starch-containing extracts can be determined by making use of the different solubility of the iodides of starch and dextrin in $CaCl_2$ solution, and data are given for various plant leaves. F. A. A.

Comparative amounts of sulphur, phosphorus, and nitrogen in plants cultivated on the same soil. G. Bertrand and L. Silberstein (Compt. rend., 1936, **203**, 1481—1483; cf. A., 1936, 395, 650).—The S/P ratios for 13 different plants grown under the same conditions fell within the limits previously given, as did the S/N ratios. For celery collected before flowering S/P was 11·12, and if collected at the flowering stage, S/P was 7·50; the S/N ratio was 0·62. J. N. A.

Highly polymerised natural products. K. Hess (Angew. Chem., 1936, **49**, 841—843).—A discussion of outstanding problems relating to the structure of cellulose. F. L. U.

Analysis of carotene. M. Piccinini (Boll. Chim.-farm., 1936, **75**, 642, 645—646).—The pericarp of a tropical fruit yields carotene (I) and a hydrocarbon, $C_{30}H_{48}$, m.p. 180°, with 5 double linkings and probably related to 1 : 1′ : 3 : 3′-rubene. The physiological properties of (I) and its possible relationship to vitamin-*D* are discussed. F. O. H.

Resin phenols. V. Natural phenolic substances of the "dimeric coniferyl type."—See A., II, 69.

Constitution of ayapanin.—See A., II, 70.

Constituents of bark of *Zanthoxylum americanum*. II. Xanthyletin.—See A., II, 72.

Alkaloid from *Equisetum palustre*.—See A., II, 80.

Calotropin, the African arrow poison. I.—See A., II, 71.

Properties of the silver electrode and titration of the total and active chlorine ion in organisms.—See A., I, 96.

Methods of biological assay. J. H. Burn (Arch. exp. Path. Pharm., 1936, **184**, 37—50).—A lecture. P. W. C.

Albumin–globulin ratios in synthetic solutions deduced from determinations of specific gravity and relative viscosity. R. L. Nugent and L. W. Towle (Proc. Soc. Exp. Biol. Med., 1935, **33**, 374—378).—In synthetic solutions the ratios can be deduced from determinations of relative η and d made according to the procedure described. W. McC.

Determination of hydroxylated acids of fats. P. G. Hafner, R. H. Swinney, and E. S. West (J. Biol. Chem., 1936, **116**, 691—697).—A simplification of the method of West *et al.* (A., 1934, 510) for the determination of Ac vals. of lipins and of their free insol. acids by acetylation is described. A no. of the common animal and vegetable fats contain detectable amounts of OH-acids. E. A. H. R.

Determination of residual nitrogen in blood, plasma, serum, etc. E. Noyons (Chem. Weekblad, 1937, **34**, 76).—Apparatus suitable for steam-distilling NH_3 into standard acid in micro-Kjeldahl N determinations is described. S. C.

Conductometric determination of chlorides in biological liquids. S. Mihaéloff (Bull. Soc. chim., 1936, [v], **3**, 2395—2403).—The conductometric titration with $AgNO_3$ of Cl′ in normal and defibrinated blood, serum, urine, and cerebrospinal fluid gives results equal in accuracy to those given by other classical methods. The method requires only a few drops of liquid. F. L. U.

Micro-determination of iodine in biological material. H. Wilmanns (Biochem. Z., 1936, **289**, 41—51).—Leipert's method (A., 1934, 795) is investigated and inaccuracies in Sturm's modification of it (A., 1935, 1518) are detected and surmounted. The normal blood-I is 7—15 $\times$ 10^{-6}%. P. W. C.

Determination of zinc in biological material. M. Sahyun and R. F. Feldkamp (J. Biol. Chem., 1936, **116**, 555—562).—The volumetric ferricyanide procedure is applied to biological materials. The pancreas of ox, calf, sheep, and pig contain 20—40 mg. of Zn per kg. fresh wt. Commercial insulin contains 0·05—0·1 mg. of Zn per 1000 units. F. A. A.

Micro-determination of manganese in biological products. P. Cheramy and A. Lemos (J. Pharm. Chim., 1937, [viii], **25**, 17—20).—The material is digested with HNO_3–H_2SO_4–$HClO_4$, treated with 10% aq. $NaHSO_4$, filtered, and the filtrate digested with H_2SO_4–$K_2S_2O_8$–$AgNO_3$, diluted, and MnO_4' titrated with standard H_2O_2 solution. The Mn content of liver (calf, ox, rabbit) is 2·6—3·1 $\times$ 10^{-4}%. F. O. H.