BRITISH CHEMICAL ABSTRACTS

A., III.—Biochemistry

AUGUST, 1937.

Relation between hypoglycæmia and anoxæmia. L. F. Moldavsky and E. Gellhorn (Proc. Soc. Exp. Biol. Med., 1937, **36**, 92—94).—The rise in blood pressure which occurs in O_2 deficiency is magnified by injection of insulin, the latter effect being offset by injection of glucose. P. G. M.

Influence of carbon dioxide on blood pressure reaction to oxygen deficiency. E. H. Lambert and E. Gellhorn (Proc. Soc. Exp. Biol. Med., 1937, **36**, 169—171).—The beneficial effect of CO_2 in O_2 deficiency is ascribed in part to its direct action on the circulation as well as to its effect on respiration. W. O. K.

Regeneration of carbonic anhydrase in the blood of *Rana salata*. R. Margaria and R. Ferrari (Enzymologia, 1937, **2**, 117—120).—After perfusion of a frog with Ringer's solution for 30 min. carbonic anhydrase (I) is completely removed from the blood. (I) reappears in the circulating fluid within 30 hr. from the perfusion and after 10 days increases to 24% of the normal val. During regeneration of the corpuscles their (I) content increases up to a max. of 9 times the normal. (I) and hæmoglobin vary independently in the erythrocytes. E. A. H. R.

Hartridge reversion spectroscope for examination of blood for carbon monoxide; improvements in design, assembly, and technique. R. C. Frederick (Analyst, 1937, **62**, 452—454). E. C. S.

Factors influencing sedimentation rate of erythrocytes. J. Zozaya (Proc. Soc. Exp. Biol. Med., 1937, **36**, 182—186).—Sedimentation of blood corpuscles depends on their concn., but not significantly on the albumin : globulin ratio or total protein of the serum. Of the various serum-protein fractions, fibrinogen and euglobulin promote and albumin retards sedimentation, whilst pseudoglobulin is intermediate. Lecithin lowers and cholesterol increases the sedimentation rate, whilst various metallic ions exert effects corresponding with their position in the Hofmeister series. W. O. K.

Modifications of the Rous-Turner solution for preservation of bird erythrocytes. A. Golden and M. R. Irwin (Proc. Soc. Exp. Biol. Med., 1937, **36**, 234—236).—Chick, pigeon, or dove erythrocytes are best preserved in a mixture of (*a*) 100 c.c. of Locke's solution + 32—34 c.c. of H_2O, and (*b*) an equal vol. of 4·2% or 5·4% aq. glucose. W. O. K.

Formation of erythrocytes in the embryonic pancreas. R. Michalowski (Compt. rend. Soc. Biol., 1937, **125**, 163—166).—The "cloudy cells" of Laguesse in the pig's embryo cannot synthesise hæmoglobin or transform it into erythrocytes. H. G. R.

Coupling of respiration and phosphorylation of adenylic acid in the hæmolysate of horse erythrocytes. A. Lennerstrand (Naturwiss., 1937, **25**, 347—348).—The system hæmolysed horse erythrocytes + hexosediphosphoric acid + pyocyanin (I) + cozymase (II) utilises O_2, and on addition of PO_4''' the utilisation increases, part of the PO_4''' becoming fixed organically. No CO_2 is formed and adenosinetriphosphoric acid (III) cannot replace (II). Addition of $CH_2I{\cdot}CO_2H$ inhibits O_2 utilisation and phosphorylation completely but NaF and $Na_2C_2O_4$ are without effect. Adenylic acid (IV) added to the system along with PO_4''' is converted into (III) and simultaneously the org. P is decreased. The phosphorylation of (IV) does not occur if (I) or (II) is absent, phosphorylation being coupled with the oxidation process. P. W. C.

Effect of scalding on erythrocyte and leucocyte counts and hæmoglobin in rabbits. O. Lambret, J. Driessens, and M. Cornillot (Compt. rend. Soc. Biol., 1937, **125**, 661—662).—A reduction, corresponding with the decrease in the circulating blood, was observed. H. G. R.

Leucocytosis of parturition. E. M. Boyd, G. W. Blenkinsop and G. Mylks, jun. (Proc. Soc. Exp. Biol. Med., 1937, **36**, 300—301).—No significant change in lipin concn. of leucocytes occurs during parturition. P. G. M.

Erythrocruorins (hæmoglobins of invertebrates). J. Roche and R. Combette (Bull. Soc. Chim. biol., 1937, **19**, 613—626).—The erythrocruorins of *Arenicola marina*, *Dasybranchus caducus*, and *Glyçera gigantea* possess a high arginine (10%) and a low lysine (<5%) content, vary amongst themselves in solubility etc., and have a mol. wt. (determined by the osmotic pressure method) of 362,000, 26,200, and 56,600, respectively (cf. this vol., 164). P. W. C.

Magnetic properties and structure of ferrihæmoglobin (methæmoglobin) and its compounds.—See A., I, 293.

Crystallisation of carboxyhæmoglobin from dried blood of various animal species and its application to forensic medicine. E. Biocca (Atti R. Accad. Lincei, 1937, [vi], **23**, 368—371; cf. A., 1935, 640).—From experiments, the rule is proposed that if either fresh blood that has been hæmolysed by saponin, or blood that has been dried for

some months and taken up in distilled H_2O, is found capable, when treated with CO, of giving cryst. carboxyhæmoglobin, it is not human blood. E. W. W.

Determination of bilirubin in blood-plasma. G. A. D. Haslewood and E. J. King (Biochem. J., 1937, **31**, 920—923).—Plasma (1 c.c.) and diazo-reagent (0·5 c.c.) are mixed and treated with saturated $(NH_4)_2SO_4$ (0·5 c.c.) and EtOH (3 c.c.). The mixture after shaking and keeping is filtered and the clear filtrate compared with a Me-red standard using a green light filter. P. W. C.

Blood-protein in anaphylactic states. A. Garipuy and P. Valdiguié (Compt. rend. Soc. Biol., 1937, **125**, 345—347).—The ratio albumin : globulin is normal during a crisis but is increased during the intermediate periods. H. G. R.

Physico-chemical properties of serum-proteins isolated by the acetone method. A. Boutaric (Protoplasma, 1936, **18**, 286—298; Chem. Zentr., 1936, i, 3355).—Comparison of physical properties of blood sera with those of aq. suspensions of the proteins obtained by the $COMe_2$ method indicates that at low temp. the method separates the protein mol. as such. A. G. P.

Influence of vitamin-*C* on the colloid-osmotic pressure and the protein content of blood-serum. I. Garta (Biochem. Z., 1937, **290**, 364—369).—The colloid-osmotic pressure and the albumin : globulin ratio of guinea-pig's serum decrease during scurvy, and on administration of ascorbic acid (I) increase again, as does also the total protein content. The effect is due to the antagonistic action of thyroxine and (I). P. W. C.

Optical activity of sera and of solutions of their proteins separated by the cold acetone method. C. Achard, A. Boutaric, and M. Roy (Compt. rend., 1937, **204**, 1288—1290).—The $COMe_2$ extraction method separates serum-proteins which, when dissolved in 0·1*N*-NaOH, have the same $[\alpha]_D$ as the original serum. J. L. D.

Proteins of transudates (ascites) and of serum. J. Roche, J. Olmer, and L. Samuel (Compt. rend. Soc. Biol., 1937, **125**, 154—156).—The ratio albumin : globulin of the transudate is > that of the serum. H. G. R.

Dissociation of [serum-]globulin into the viscous protein and hæmoglobin. M. Doladilhe (Compt. rend. Soc. Biol., 1937, **125**, 409—410).—Hofmeister's globulin is a mixture of the viscous protein and hæmoglobulin. H. G. R.

Albumin, globulins, and fibrinogen of serum and plasma. W. R. Campbell and M. I. Hanna (J. Biol. Chem., 1937, **119**, 15—33).—A method for the determination of albumin and globulins in serum using Na_2SO_3 as precipitant and a Cu–Se–H_2SO_4–H_3PO_4 mixture as protein digestant is described. Using 12·5% Na_2SO_3 fibrinogen can be rapidly salted out from oxalated, citrated, or heparinised plasma. Using various concns. of Na_2SO_3, the globulin fractions represent zones of max. pptn. of protein and they parallel the content of fibrinogen, euglobulin, and pseudoglobulins-I and -II in the plasma. The euglobulin and pseudoglobulin-I fractions are represented in human placental blood. J. N. A.

Globins. IV. Combination of globins with protohæmatin and the mol. wt. of synthetic hæmoglobins. J. Roche and R. Combette (Bull. Soc. Chim. biol., 1937, **19**, 627—641; cf. this vol., 111).—A method is outlined for the prep. of natural globin (I) of sheep, rabbit, ox, and pig, and of synthetic methæmoglobin (II) [protohæmatin (III) + (I)] of horse, rabbit, and ox. The mean mol. wts. of these various natural [$K_3Fe(CN)_6$ + pigment] and synthetic (II), determined by the osmotic pressure method, are 63,400 and 63,300, respectively, and in solution they show no marked tendency to polymerise. The synthetic (II) are, however, more readily degraded into (III) and (I) by bases than are natural (II). P. W. C.

Reactions between coagulating acids and proteins. L. Abraham (Compt. rend. Soc. Biol., 1937, **125**, 382—386).—Coagulation of plasma-proteins with HNO_3 and $CCl_3{\cdot}CO_2H$ corresponds with salt formation, whilst with phosphotungstic acid pptn. occurs in alkaline medium above the isoelectric point. H. G. R.

Lipoproteins of blood-serum. Nature of the constituent proteins. M. A. Machebœuf and M. Januszkiewicz (Bull. Soc. Chim. biol., 1937, **19**, 694—706).—The prep. of the undenatured proteins forming the lipoproteins (I) of serum is described and the proteins are shown to be identical in properties with serum-albumins. (I) are not simple adsorption products. P. W. C.

Lipins of different protein fractions of blood-serum. J. Janicki and D. Assenhajm (Biochem. Z., 1937, **291**, 21—33).—Sera from different species and different individuals in the same species differ, sometimes greatly, in the lipin (I) content of their proteins. (I) is not removed by exhaustive extraction with Et_2O followed by extraction with CH_2Cl_2. The (I) content of seralbumin (II) of goose- is > that of (II) of horse-, ox-, and sheep- and (I) is much more readily removed from goose- (II) than from horse-, ox-, and sheep- (II). The (I) content of euglobulins (III) differs from that of pseudoglobulins (IV). (I) of H_2O-sol. globulins (V) is more easily extracted than is (I) of H_2O-insol. (V), the insolubility of which appears to be due to their (I) content. Electrodialysis removes more (I) from (II) than does ordinary dialysis. The cholesterol : P ratios of (II) are : horse and goose approx. 14, sheep 17·2, ox 21·9. In (V) this ratio varies greatly, in (III) being usually < in (IV). W. McC.

Colorimetric determination of lipoid phosphorus [lecithin] in the blood. R. N. Chopra and A. C. Roy (Indian J. Med. Res., 1936, **24**, 479—486).—Methods so far used give untrustworthy results but accuracy is obtained by extracting the lecithin by Bloor's method (A., 1918, ii, 452), digesting it as described by Roe *et al.* (A., 1926, 763), and applying the colorimetric technique of Benedict and Theis (A., 1924, ii, 700). Nutr. Abs. (*m*)

Lipins of blood in new-born infants. E. M. Boyd (Amer. J. Dis. Child., 1936, **52**, 1319—1324).—

The lipin content of the erythrocytes is the same in children as in adults. In newborn children the lipin content of the plasma is < in adults, the vals. as % of those for normal adults being: total lipins 34, neutral fat 58, total fatty acids 40, total cholesterol (I) 21, (I) ester 17, free (I) 30, phospholipin 31.
NUTR. ABS. (*m*)

Cholesterol and fatty acids in blood-plasma of male and female rats. H. H. WILLIAMS, J. MELVILLE, and W. E. ANDERSON (Proc. Soc. Exp. Biol. Med., 1937, **36**, 292—295).—Free cholesterol in plasma averages 32 and 30% of the total, whilst the fatty acid concn. averages 121 and 150 mg. per 100 c.c. in male and female rats respectively.
P. G. M.

Cholesterol content of blood-serum, -plasma, and erythrocytes. E. CHABROL and J. L. PARROT (Compt. rend. Soc. Biol., 1937, **125**, 432—434).—The ratio of cholesterol (I) in the plasma to that in the erythrocytes decreases as the val. for plasma-(I) decreases.
H. G. R.

Determination of blood-cholesterol. Precipitation of the cholesterol–digitonin complex in water–acetone–trichloroethylene medium. M. PAGET and G. PIERRART (Compt. rend. Soc. Biol., **125**, 654—657).—Pptn. of cholesterol in C_2HCl_3 solution by digitonin in MeOH–EtOH–C_2HCl_3 solution in presence of $COMe_2$ is recommended.
H. G. R.

Dynamics of glutathione in disturbed circulation. S. I. MALKIN, T. A. MAKAROVA, and W. S. SARBETEVA (Z. ges. exp. Med., 1936, **97**, 523—533).—In high altitudes the proportion of oxidised and total glutathione in venous blood increases.
A. G. P.

Non-glucose reducing substances in blood. II. Vitamin-*C* fraction. V. K. N. MENON (Indian J. Med. Res., 1935, **23**, 447—454).—Ascorbic acid accounts for only 10—20% of the non-glucose reducing fraction of blood, which represents a mixture of several substances.
R. N. C.

Water intake and blood-sugar level. M. C. HRUBETZ (Proc. Soc. Exp. Biol. Med., 1937, **36**, 420—422).—Restriction in H_2O intake is associated with high blood-sugar.
H. G. R.

Transpancreatic diathermy and regulation of the blood-sugar. J. MICHEZ (Compt. rend. Soc. Biol., 1937, **125**, 376—377).—The blood-sugar is decreased in the dog, particularly if secretion of adrenaline is prevented by ligaturing the adrenal veins.
H. G. R.

Action of human saliva in increasing blood-sugar. A. KORÁNYI, E. SZABLICS, and T. SZENES (Z. ges. exp. Med., 1936, **97**, 508—513; Chem. Zentr., 1936, i, 3355).—Intravenous administration of the saliva to rabbits effected a temporary decrease followed by an increase in blood-sugar (max. at 35 min.). Insulin-induced hypoglycæmia is counteracted by saliva. Muscle weakening following the injection results from glycolysis.
A. G. P.

Effect of sodium dithiodipentanedicarboxylate on experimental hyperglycæmia. R. TOAFF (Arch. Farm. sperim., 1937, **63**, 49—61).—Intramuscular injection of the salt (0·0065—0·0162 g. per kg.) into rabbits lowers the fasting or alimentary hyperglycæmic blood-sugar.
F. O. H.

Carbohydrate metabolism. I. Micro-electrometric determination of blood-sugar. G. SANKARAN and K. RAJAGOPAL (Indian J. Med. Res., 1936, **24**, 459—478).—The sugar content of 0·02 ml. or less of blood can be determined accurately by a modification of the method of Shaffer and Williams.
NUTR. ABS. (*m*)

Determination of fermentable blood-sugar by measurement of carbon dioxide formed by the action of yeast. R. F. HOLDON, jun. (J. Biol. Chem., 1937, **119**, 347—368).—Rapid determinations of fermentable blood-sugar in 0·02 c.c. of blood can be made by measurement of CO_2 produced by yeast in Van Slyke's apparatus.
P. G. M.

[Micro-]determination of blood-ketones. R. H. BARNES (Proc. Soc. Exp. Biol. Med., 1937, **36**, 352—353).
H. G. R.

Relation between absorption of food and the alcohol content of the blood in man. W. SCHWAGMEYER (Arch. exp. Path. Pharm., 1937, **185**, 102—112).—Absorption of food decreases the EtOH concn. of blood. The decrease does not depend on the amount of food, which only causes a delay in excretion of EtOH, nor on its calorific content, but is caused by esterification of EtOH with degradation products of the food, particularly NH_2-acids, and is therefore regulated to some extent by the digestibility of the food.
P. W. C.

Blood-alcohol. J. KOLLER (Deut. Z. ges. gerichtl. Med., 1936, **26**, 234—241; Chem. Zentr., 1936, i, 3375).—Results of 661 determinations are recorded. The presence of Et_2O interferes with the determination.
H. J. E.

Blood-alcohol determination. F. KÜNKELE (Deut. Z. ges. gerichtl. Med., 1936, **26**, 241—244; Chem. Zentr., 1936, i, 3375—3376).—The ratio of the EtOH content of the serum to the total EtOH content of the blood was 1·2 : 1.
H. J. E.

Systematic errors in blood analysis. I. Data obtained after deproteinisation by Moog's method. M. D. MEZINCESCO (Bull. Soc. Chim. biol., 1937, **19**, 109—112).—The sources are indicated for errors of 10—20% in vals. for urea-N etc. in blood filtrates after deproteinisation by $CCl_3{\cdot}CO_2H$.
F. O. H.

Biological phenomena of membranes. Distribution of sodium chloride and glucose between plasma and aqueous humour. Y. DERRIEN, G. JAYLE, and P. FRIZET (Compt. rend. Soc. Biol., 1937, **125**, 148—150).—The ratio of glucose in the aq. humour to that of the plasma is <1 and for NaCl is >1, the ratios being inversely related to one another.
H. G. R.

Determination of corpuscle-/plasma-chloride ratio. M. LÉVY and S. MIGNON (Bull. Soc. Chim. biol., 1937, **19**, 234—243).—A criticism of the technique of Paisseau *et al.* (A., 1936, 1015).
A. L.

Influence of anti-coagulants on the partition of chloride ions between plasma and corpuscles. H. HIGOUNET (Bull. Soc. Chim. biol., 1937, **19**, 53—

59).—NaF, $K_2C_2O_4$, or Na citrate decreases corpuscular vol., NaF and $K_2C_2O_4$ producing a transport of H_2O and Cl′ from corpuscles to plasma. With blood collected under oil, the partition of Cl′ is unchanged whilst with blood in contact with the air, the plasma-Cl′ is > and < the normal val. with small and large amounts of anti-coagulant, respectively. Polymerised Na anetholedisulphonate affects neither corpuscular vol. nor partition of Cl′. F. O. H.

A synthetic anti-coagulating, anti-fermenting substance [for blood]. H. Higounet (Compt. rend. Soc. Biol., 1937, **125**, 119—120).—Polymerised Na anetholedisulphonate suppresses the ionic exchanges of blood in contact with air (cf. preceding abstract). H. G. R.

Bromine content of blood. H. Doering (Biochem. Z., 1937, **291**, 81—87; cf. A., 1937, I, 260).—The Br in 3 c.c. of blood is converted first into AgBr by the Carius method and then into $ZnBr_2$ with Zn dust. The Br is then determined as previously described. For the determination of Br in serum and plasma org. matter is destroyed in an open vessel at 100° and the analysis is complete in 1 hr. 100 c.c. of human blood contain 0·2—0·4 mg. of Br. W. McC.

Colorimetric determination of potassium. A. M. Alexeeva (Bull. Biol. Méd. exp. U.R.S.S., 1936, **1**, 301—302).—The K of 0·5 ml. of serum is pptd. as $K_4Co(NO_2)_6$, the ppt. dissolved in dil. H_2SO_4, the Co converted into sulphite by addition of alkali sulphite, and the colour of the colloidal $CoSO_3$ compared with that of a standard. Nutr. Abs. (*m*)

Calcium and potassium content of the blood, blood-plasma, and erythrocytes of the rabbit. J. Lebioda (Med. dosw. społ., 1936, **21**, 290—315).—The K contents of the blood, plasma, and red blood cells of rabbits are 126—229, 13—31, and 367—503 mg. per 100 ml. respectively. The corresponding vals. for Ca are 6·3—13·4, 9·8—18·9, and 2·7—7·3, respectively. Nutr. Abs. (*m*)

Comparison of the distribution of magnesium in blood cells and plasma of animals. D. F. Eveleth (J. Biol. Chem., 1937, **119**, 289—292).—Cattle are the only animals that usually show higher plasma- than cell-Mg. Sheep and goats have only a slightly higher cell-Mg. Low cell-Mg is confined to ruminants. P. G. M.

Determination of lead in whole blood. H. Kraft-Ström, K. Wülfert, and O. Sydnes (Biochem. Z., 1937, **290**, 382—393).—A modification of the dithizone (I) method (cf. Willoughby *et al.*, A., 1935, 1094) is described for determination of small amounts ($0·5—10 \times 10^{-6}$ g.) of Pb in blood etc. (5—10 c.c.) in which the removal of Fe is unnecessary and all pptn. and filtration are avoided. Oxidative action of Fe is excluded by addition of $Na_2S_2O_4$. Pptn. of Fe is avoided by the presence of NH_4 citrate and the Fe is converted into a stable complex by addition of KCN. (I) is extracted in N_2. The max. and mean scattering of results correspond with an accuracy of 6·5 and 3·8%, respectively. P. W. C.

Ratio of different phosphorus compounds in the blood and tissues during growth of rabbits. K. Takagi (Mitt. med. Akad. Kioto, 1936, **18**, 617—675, 805—806).—The content of P compounds in the blood immediately after birth increases to a max. in 10 days, remains high for 2 months, and then decreases to steady vals. The amounts of PO_4''' in muscle, liver, and kidney are considerably > in blood and no regular variations in the contents are found. In blood and skeletal muscle the acid-sol. PO_4''', in heart muscle, liver, and kidney the acid-insol. PO_4''', predominates. At 2—3 months of age, when the food of the young is changing, variations in the amounts of acid-insol. PO_4''' are noted. Nutr. Abs. (*m*)

Effect of the boiler-makers' work on composition and properties of their blood. II. Acid–base balance of the blood. III. Lactic acid content of the blood. Meer S. Mischkis and Maria S. Mischkis (Ukrain. Biochem. J., 1937, **10**, 23—35, 36—47; cf. A., 1936, 1530).—II. Towards the end of a day of heavy labour, the total CO_2 of blood-plasma decreases, due to a decrease both in free CO_2 and $NaHCO_3$. These decreases are approx. equal so that the p_H does not alter. The changes, due apparently to a primary alkali deficiency followed by a compensatory fall in the free CO_2, involve an alteration of the acid–base balance opposite in direction to that experienced during short spells of severe muscular exercise.

III. The lactic acid content of the blood at the end of the day is abnormally low, evidently due to more efficient removal of lactic acid in trained workers during prolonged heavy work. This alteration is opposite in direction to that experienced during short spells of severe exercise. W. O. K.

Diffusion in coagulated blood-serum. B. Serény (Biochem. Z., 1937, **290**, 327—333).—Tables summarise the diffusion rates of various acids, alkalis, salts, and hæmoglobin in gels obtained by heat-coagulation of serum. P. W. C.

Variations in optical density and viscosity of serum on dilution with physiological solution. A. Boutaric and M. Roy (Bull. Soc. Chim. biol., 1937, **19**, 44—52).—Data for the changes in optical density and η on dilution of serum (horse) with 0·85% aq. NaCl indicate that no significant agglutination of colloidal constituents occurs. F. O. H.

Endocrinological serum-interferometry of normal and scorbutic guinea-pigs. L. Randoin and A. Raffy (Bull. Soc. Chim. biol., 1937, **19**, 119—124).—No significant changes could be detected in the activity of pituitary, thyroid, adrenal, and testicular glands when the sera were examined by Hirsch's method (cf. Guillaumin, A., 1934, 428). F. O. H.

Comparison of the Wassermann reaction carried out on whole serum and on serum precipitated by hydrochloric acid. A. Fanzères and E. Morais (Compt. rend. Soc. Biol., 1937, **125**, 182—184).—The reaction is more sensitive if carried out on the serum after pptn. by HCl. H. G. R.

Hæmolytic power of saponins *in vitro* and their effect on the viscosity of blood-serum. L. Marceron and H. C. de Mauny (Compt. rend.

Soc. Biol., 1937, **125**, 349—350).—No correlation was observed between hæmolytic power and decrease in η. H. G. R.

Action of ozonised oxygen on the hæmolytic properties of sera. E. PEYRE and H. MORICOURT (Compt. rend. Soc. Biol., 1937, **125**, 642—643).—On passing ozonised O_2 through serum, the p_H is decreased and the hæmolysin destroyed. H. G. R.

Spectrophotometry of hæmolysis. J. GUTMAN (Compt. rend. Soc. Biol., 1937, **125**, 161—163).—The process of hæmolysis can be divided into two stages, the "incubation" when the complement is fixed by the red cells, and the hæmolysis proper, the amount of hæmoglobin liberated depending on the quantity and the speed with which the complement is adsorbed. H. G. R.

Occurrence in mammalian tissue of a lipoid fraction acting as inhibitor of blood clotting. E. CHARGAFF (Science, 1937, **85**, 548—549).—Cerebroside fractions obtained from the brain of sheep and pigs contain a substance which acts as inhibitor of the clotting of blood and plasma. A substance of similar activity has also been isolated from a crude lipin extract of the spinal cord of cattle. The purest preps. contain N and P, and only small amounts of S. L. S. T.

Activity coefficients of calcium and oxalate ions in plasma. Significance of concentration of calcium ions in blood clotting. R. NORDBÖ (Skand. Arch. Physiol., 1936, **75**, Suppl. 11, 1—46).—An account is given of the determination of the coeff. and of the solubility of CaC_2O_4 in salt solutions and in serum-ultra-filtrates. No relationship exists between clotting time and concn. of colloidal Ca, but the clotting time decreases as [$Ca^{\cdot\cdot}$] increases. If plasma is left for 24 hr. at 1—3° with an amount of oxalate exactly equiv. to the total plasma-Ca, the concn. of diffusible Ca is not greatly altered owing to the solubility product of CaC_2O_4 in plasma. Such plasma, after warming to 25°, clots in 8—10 hr. If an excess of oxalate amounting to 1 mg. per kg. of H_2O is added no clotting occurs after warming to 25°. Fibrinogen gave results similar to those obtained with plasma. Glycolysis appears not to be coincident with the first phase of clotting. The results show that a min. [$Ca^{\cdot\cdot}$] in the plasma is necessary for clotting, and that the Ca-binding capacity of the plasma-proteins is unimportant. The combination of Ca with the plasma colloids which accompanies clotting is an attendant phenomenon and not a necessary condition. The results do not contradict the view that thrombin (I) is a colloidal Ca compound present in very low concn. and already in equilibrium with $Ca^{\cdot\cdot}$. The necessary min. [$Ca^{\cdot\cdot}$] required for clotting would then depend on the concn. of the colloid which together with Ca forms (I). The greater is the concn. of this colloid, the smaller is the [$Ca^{\cdot\cdot}$] required. NUTR. ABS. (*m*)

Alexin in the new-born. L. NATTAN-LARRIER, L. GRIMARD, and J. DUFOUR (Compt. rend. Soc. Biol., 1937, **125**, 358—361).—Alexin is present only in small quantities in the serum of the new-born. H. G. R.

Effect of ageing on the alexin content of human serum. L. NATTAN-LARRIER and L. GRIMARD (Compt. rend. Soc. Biol., 1937, **125**, 512—515).—The resistance of human serum to ageing is approx. 30% of that of guinea-pig serum. H. G. R.

Precipitin reactions of ovalbumins. L. HEKTOEN and A. G. COLE (Proc. Soc. Exp. Biol. Med., 1937, **36**, 97—99).—Chicken ovalbumin gives rise to a single sp. antibody, whilst the ovalbumins of the pearl guinea fowl and Amherst pheasant give rise to several antibodies. P. G. M.

Effect of pneumococcus type III specific polysaccharide on sedimentation of blood cells. W. J. NUNGESTER and L. F. KLEIN (Proc. Soc. Exp. Biol. Med., 1937, **36**, 315—317).—The sedimentation rate of citrated human blood is increased 58-fold by 0·3% of the sp. polysaccharide. P. G. M.

Chemo-specific flocculation of sterols by anti-sterol sera. A. J. WEIL and L. E. DEN D. DE JONG (Proc. Soc. Exp. Biol. Med., 1937, **36**, 238—240).—By suitable immunisation, rabbit sera may be prepared which give sp. flocculation reactions with sols of cholesterol, dihydrocholesterol, and oxycholesterol respectively. Cross reactions observed are much less marked than the flocculations with homologous antigens. W. O. K.

Immunity and the virus-neutralising antibody. Passive immunity against vaccine virus. O. ANDERSEN (Z. Immunitäts., 1937, **90**, 207—218).—With partial immunity caused either by passive or active immunisation, a virus-neutralising antibody is present; the course of vaccination, however, is protracted in the first case and, owing to the presence of a further factor, accelerated in the second. C. R. S.

Antigenic effect of purified typhoid autolysates giving negative protein reactions. E. KRÖGER (Z. Immunitäts., 1937, **90**, 223—228).—Old cultures of *B. typhosus*, deproteinised with $FeCl_3$, tannic acid, or $Fe(OH)_3$, give agglutinin and/or precipitin reactions. Hence biologically active proteins which cannot be detected by chemical reagents are present. C. R. S.

Change in immunising power of typhoid bacilli in a medium containing homologous immune sera and the formation of a new variety. T. TAKANO (Z. Immunitäts., 1937, **90**, 229—234).—Different forms of *B. typhosus* were kept for 7 years in a broth containing homologous immune sera. A variety rich in β-sp. receptors was thus produced. C. R. S.

Relation between the formation of agglutinins and the intermediary metabolism of fat and carbohydrates. S. LAJOS (Z. Immunitäts., 1937, **90**, 261—270).—After intravenous injection of killed typhoid bacilli into rabbits, the liver-lipins increase and the -carbohydrates decrease whilst the blood-lipins (except phosphatides) diminish. Similar changes occur after the injection of NaF, alone or with killed typhoid bacilli. Injection of the bacilli occasionally diminishes the agglutinin titre whilst treatment with NaF and typhoid vaccine produces a subnormal formation of antibodies. C. R. S.

Type-specificity of heat-extractive antigens. II. Formation of antibodies in the lungs by means of the intrapulmonary injection of coctigens, especially of tubercular antibodies. R. Torikata and H. Fukutomi (Z. Immunitäts., 1937, **90**, 247—256).—The injection of aq. extracts of *B. tuberculosis* and of *B. coli* produced antigens which could be detected locally and later in the blood, and produced homologous and heterologous immunisation. C. R. S.

Chemical and immunological mechanism of the infection and immunity by anthrax. I. Chemical structure of the capsular substance of *Bacillus anthracis* and of the serologically identical specific substance of *Bacillus mesentericus*. G. Ivánovics and V. Bruckner (Z. Immunitäts., 1937, **90**, 304—318).—The haptens of the membranes of *B. anthracis* and *B. mesentericus* are serologically and chemically identical, hydrolysis (HCl) indicating a polypeptide consisting only of *l*-glutamic acid. C. R. S.

Stability of absorbed immune sera for the *M*-*N*-diagnosis of blood groups. S. Olbrich (Z. Immunitäts., 1937, **90**, 271—286).—Absorption preps. of the sera, even when dried, remain active for 2 years. C. R. S.

Anti-gonadotropic sera. R. Demanche, G. Laroche, and H. Simonnet (Compt. rend. Soc. Biol., 1937, **125**, 112—113).—The anti-gonadotropic action of rabbit's serum is not accompanied by sensitising properties capable of fixation of the complement. H. G. R.

Effect of ageing on the anti-complementary power of human serum. L. Nattan-Larrier, L. Grimard, and J. Dufour (Compt. rend. Soc. Biol., 1937, **125**, 113—115).—The anti-complementary power developed after a few days' storage at 5° and persisted for 2 years. Heating to 56—57° and 60—62° caused loss of this power in 55·6% and 62·5% of the samples, respectively. H. G. R.

Combined action of heat and ageing on the anti-complementary power. L. Nattan-Larrier and L. Grimard (Compt. rend. Soc. Biol., 1937, **125**, 116—118).—The anti-complementary power either does not develop, or is rapidly lost on storage at 5°, in sera which have been heated to 56—57°. H. G. R.

Production of staphylococcus antitoxin from anatoxins of different antigenic power. P. Nélis (Compt. rend. Soc. Biol., 1937, **125**, 128—130).—An anatoxin, apparently inactive by flocculation or fixation methods, produces an appreciable quantity of antitoxin in the rabbit. H. G. R.

Influence of anatoxins on blood composition. W. de Weerdt (Ann. Soc. Sci. Bruxelles, 1937, [ii], **57**, 138—158).—Staphylococcus, diphtheria, and tetanus anatoxins when injected into the rabbit produce an anæmia with a tendency to spontaneous remission. Staphylococcus anatoxin also causes a large increase in no. of leucocytes, whilst the others have practically no leucogenic action. J. N. A.

Antigens of anthrax bacteria. W. Schaefer and G. Sandor (Compt. rend. Soc. Biol., 1937, **125**, 336—338).—An antigen similar to that from the anthrax capsule is present in certain mucous strains of *B. mesentericus*, whilst the somatic antigen from the anthrax bacterium itself is sp. H. G. R.

Antigen *O* and the specific human antigen. P. Moureau (Compt. rend. Soc. Biol., 1937, **125**, 366—367).—These antigens are not identical. H. G. R.

Adsorption of antigens by antibodies or *vice versa*. I, II. B. N. Ghosh (Indian J. Med. Res., 1935, **23**, 285—303, 837—846).—Theoretical. R. N. C.

Serological constitution of ox serum and agglutinogen *O*. P. Moureau (Compt. rend. Soc. Biol., 1937, **125**, 367—368).—Antigen *O* is not identical with the heterogenic antigen of sheep erythrocytes. H. G. R.

Sensitisation of guinea-pigs with heterogenic lipins together with a suspension of carbon particles, and ineffective attempts at auto-sensitisation with the animal's own lipins. P. E. Martin and E. Receveur (Compt. rend. Soc. Biol., 1937, **125**, 663—665). H. G. R.

Phosphorescent minerals of the bony tissues of frogs (*Rana esculenta*, L.). G. Brooks (Compt. rend., 1937, **204**, 1447—1448).—The phosphorescence of the ashed tissue under ultra-violet light is due to small amounts of Mn and Zn. E. M. W.

Solubility of bone salt.—See A., I, 412.

Chemical composition of human teeth. Effect of physiological stimuli. M. L. Le Fèvre and H. C. Hodge (Dent. Cosmos, 1936, **78**, 1119—1124).—Compared with those on the right side, the teeth on the left of the lower jaw of a patient who chewed exclusively on the left side of the mouth contained less inorg. matter and Ca, had a higher residue solution no., and absorbed less *X*-rays. Assuming that the teeth of the left side maintained an abnormally high blood flow, these findings are consistent with the concept that calcification occurs best in tissues of low blood supply. Nutr. Abs. (*m*)

Spectrum analysis of dental tissue for "trace" elements. W. F. Drea (J. Dent. Res., 1936, **15**, 403—406).—Traces of Al, Ba, Cu, Fe, Pb, Si, Ag, Sr, Ti, V, and Zn and larger amounts of Ca, Mg, P, and Na occur in human dentine and enamel and C occurs in dentine. The dentine contains F, and the enamel also when the drinking water contains 2 p.p.m. of F. Some teeth contain Cr, Li, Mn, and K. Nutr. Abs. (*m*)

Spectrographic analysis of thyroid glands. N. K. De (Indian J. Med. Res., 1935, **23**, 501—504).—Rat thyroids contain Al, Ca, Cu, Fe, Pb, Mg, Mn, K, P, Na, and Si; Ag and Zn are also present in some. The distribution of the metals is unaffected by the diets supplied to the animals. R. N. C.

Variation in weight and water and potassium contents of the nervous system at birth and in adults. A. Leulier and A. Bernard (Bull. Soc. Chim. biol., 1937, **19**, 664—670).—Tables summarise the wt., H_2O content, and K distribution in various parts of the nervous system of rabbit, cat, and guinea-pig at birth and at various ages. P. W. C.

Chlorine in biological substances. E. KAHANE (Bull. Soc. Chim. biol., 1937, **19**, 720—730).—It is shown by dialysis, electrodialysis, extraction with EtOH–$COMe_2$, and treatment directly with $AgNO_3$ that the whole of the Cl of normal tissues, organs, and excretions behaves as Cl′ ion. P. W. C.

Mineral matter of feathers and the normal phosphorus : calcium ratio. R. SALGUES (Compt. rend. Soc. Biol., 1937, **125**, 124—125; cf. this vol., 172).—With birds on a carnivorous diet, a decrease in the ash content with an increase in P occurs. The S content decreases with the age of the feathers and the P : Ca ratio is >1, whilst on a vegetable diet it is <1. H. G. R.

Isolation of amino-acids from human hair. P. S. YANG and C. T. CHENG (J. Chinese Chem. Soc., 1937, **5**, 96—99).—Human hair treated with hot 1% Na_2CO_3 and hydrolysed with 20% HCl gives yields of *l*-cystine only $\frac{1}{4}$, and of *l*-tyrosine $\frac{2}{3}$, of those from untreated hair. Fischer's ester method of separation is inapplicable. A. LI.

Nitrogenous constituents of the jellyfish *Cyanea capillata*. M. MOHR (Z. Biol., 1937, **98**, 120—124).—Glycine, betaine, *d*-arginine, and NMe_3O were isolated and colour and pptn. reactions indicated the presence of many other N compounds. W. McC.

Crystallisation of liver fraction protecting against necrosis from carbon tetrachloride or chloroform administration. J. C. FORBES and J. S. MCCONNEL (Proc. Soc. Exp. Biol. Med., 1937, **36**, 359—360).—The cryst. material (cf. this vol., 64) is probably a purine derivative. H. G. R.

Synthesis of octopine (pectenine). J. L. IRVIN and D. W. WILSON (Proc. Soc. Exp. Biol. Med., 1937, **36**, 398—399).—Octopine is *α-carboxydimethyl-amino-δ-guanidinovaleric acid*, m.p. 257—260° [*picrate*, m.p. 219° (decomp.)]. H. G. R.

Glutamic acid–pyrrolidonecarboxylic acid system.—See A., I, 411. N. M. D.

Determination of pentoses in adenylic nucleotides. J. K. PARNAS and B. UMSCHWEIF (Bull. Soc. Chim. biol., 1937, **19**, 325—335).—The pentose in the material is converted into furfuraldehyde by the prescribed method and determined colorimetrically. A. L.

Fats of "Russian" cantharides (*Lytta vesicatoria*, Fb.). M. M. JAÑOT and P. FAUDEMAY (Bull. Soc. chim., 1937, [v], **4**, 1149—1151).—The light petroleum extract from these insects contains principally palmitic and oleic acids, with linoleic, stearic, and linolenic acids (largely free), cholesterol and another (unidentified) sterol, $C_{21}H_{44}$, and another hydrocarbon. E. W. W.

Phospholipins as oxygen carriers. W. R. BLOOR and R. H. SNIDER (Proc. Soc. Exp. Biol. Med., 1937, **36**, 215—217).—A buffered suspension (p_H 5—8) of purified liver- or muscle-phospholipins (I) had no significant oxidising effect on reduced methylene-blue (II), but, after oxidation in air for 24—48 hr., the (I) became sol. in H_2O and markedly reduced (II). W. O. K.

Histo-physiology of pulmonary lipins. Digestive cycle of pulmonary lipins in the dog. L. BINET, J. VERNE, and J. L. PARROT (Compt. rend. Soc. Biol., 1937, **125**, 121—123).—Three stages were observed : the appearance of sudanophilic corpuscles in the bronchial epithelium, an increase in the lipin inclusions of the round cells, and an overloading of these cells and those of the bronchial epithelium with substances stained by the Feulgen–Verne method. H. G. R.

Adipocere of a fowl. J. F. DURAND and P. VIÈLES (Bull. Soc. Chim. biol., 1937, **19**, 336—341).—The adipocere contained 80—90% of insol., unsaturated OH-acids together with small quantities of glycerol and cholesterol. A. L.

Liberation of combined porphyrin by photolysis. J. THOMAS (Compt. rend. Soc. Biol., 1937, **125**, 386—388).—Irradiation of tissue with ultra-violet light after treatment with dil. HCl liberates combined porphyrin. H. G. R.

Physico-chemical conditions for rendering crystallin opaque. P. REISS, J. NORDMANN, and C. REISS (Compt. rend. Soc. Biol., 1937, **125**, 464—466).—Max. opacity is produced in the presence of oxidising agents at p_H 5—6. H. G. R.

Composition of cocoon-silk of *Eriogyna pyretorum* and *Theophila mandalina*. I. Inorganic constituents and nitrogen distribution. R. INOUE and A. MATSUURA (Bull. Sericult., 1937, **9**, 177—183).—The cocoons have the following respective % compositions : H_2O 11·45, 10·12; ash 1·50, 0·86; total N 19·32, 19·01; amide-N 0·40, 0·56; arginine-N 1·20, 1·01; cystine-N 0·03, 0·18; NH_2-N 0·35, 0·61; histidine-N 0·44, 0·54; lysine-N 0·035, 0·09; total $(NH_2)_1$-acid-N 12·83, 11·78; non-NH_2-N 2·89, 1·53. The ash consists mainly of SiO_2, CaO, K_2O + Na_2O, P_2O_5, and SO_3. F. O. H.

Glycoproteins. III. Polysaccharides from pig's gastric mucosa. K. MEYER, E. M. SMYTH, and J. W. PALMER (J. Biol. Chem., 1937, **119**, 73—84; cf. A., 1936, 1138).—Commercial pig gastric mucin contains a neutral polysaccharide consisting of acetylglucosamine (I) and galactose (1 : 1), and an acid polysaccharide containing (I), hexuronic acid, and ester sulphate. The former preponderates and is responsible for the very viscous nature of the mucin. It gives a blood group *A* reaction in amounts of 5—10×10^{-10} g. J. N. A.

Liver proteins. II. Albumin. J. M. LUCK and D. MARTIN (Proc. Soc. Exp. Biol. Med., 1937, **36**, 320—321).—Extraction of dog liver at p_H 4·7—7·0 with aq. NaCl yielded 2·2% of albumin. When 0·5*M*-$(NH_4)_2SO_4$ was used both the albumin and total salt-sol. protein increased up to p_H 6·3 and then remained const. (approx. 3·4 and 10·3% respectively). P. G. M.

Plasma of smooth muscle. Method of treatment with acetone at low temperatures. C. ACHARD and M. PIETTRE (Compt. rend., 1937, **204**, 1145—1147).—The plasma (from muscle of alimentary canal), p_H 6·95, yields on fractionation with $COMe_2$, two globulins (1·58, 0·95), albumin (0·88), NH_2-acids, polypeptides, Cl′ (0·23—0·28 as NaCl), inorg.

P (0·07—0·095), K (0·18—0·197), Na (0·10—0·12%), and only traces of lipins and carbohydrates. F. O. H.

Sulphites as protein precipitants. W. R. Campbell and M. I. Hanna (J. Biol. Chem., 1937, **119**, 9—14).—Using dil. human serum or plasma, complete saturation with $(NH_4)_2SO_3$ or NH_4HSO_3 ppts. all the proteins. With serum, K_2SO_3 causes slight pptn. Li_2SO_3 ppts. much protein, but at room temp. globulin pptn. is incomplete. Sulphites of Pb, Al, and Zn produce ppts. of globulins which rapidly denature. Saturated Na_2SO_3 and $NaHSO_3$ salt out serum-globulins, but pptn. of albumin is incomplete at room temp. Na_2SO_3 is the best for use with plasma. J. N. A.

Effect of urea on the degree of hydration of proteins. F. Heim (Biochem. Z., 1937, **291**, 88—98).—The amount of NaCl required to ppt. fibrinogen (I) from solution in physiological aq. NaCl is increased by addition of urea in concns. $\ll 0{\cdot}25M$, η of the (I) solutions being increased. Urea also increases η of gelatin solutions and, in sufficient concn., delays or prevents coagulation of blood. These results are explained by supposing that the degree of hydration of proteins is increased by urea. W. McC.

Polarisation optics and minute structure of coagulated fibrin. M. F. von Dungern (Z. Biol., 1937, **98**, 136—150).—Threads of coagulated fibrin show double refraction, positive with reference to their length and equal to $4{\cdot}1 \times 10^{-3}$ for air-dried threads. The sp. double refraction is $1{\cdot}5$—$2{\cdot}0 \times 10^{-3}$, n 1·54. Refraction and dichroic staining with trypan-blue indicate a structure of rod-like micelles. Similar phenomena occur with reticular coagula. The bearing of the data on the coagulation process is discussed. F. O. H.

Constituents of hydrochloric acid hydrolysates of elastin.—See A., II, 357.

Cyclol theory and the "globular" proteins. D. M. Wrinch (Nature, 1937, **139**, 972—973).—A summary. L. S. T.

Colloid reactions and biological experiments with colloidal tungstic oxide.—See A., I, 410. N. M. D.

Permeability of membranes. V. Origin of bioelectric currents.—See A., I, 408. N. M. D.

Complete permeability of all the tissues, including the skin, of the frog to alcohol. M. Nicloux (Compt. rend. Soc. Biol., 1937, **125**, 453—456). H. G. R.

Cytochromes. IV. Hæmatins-*C* and their combination with globin. J. Roche and M. T. Bénévent (Bull. Soc. Chim. biol., 1937, **19**, 642—648).—Various products grouped as hæmatins-*C* [*e.g.*, hæmatin of cytochrome-*C*, the derivative (I) obtained by successive oxidation and reduction of protohæmatin in C_5H_5N, the condensation products of the latter with glycine or C_5H_5N of Zeile and Piutti (A., 1933, 959)] all give C_5H_5N-hæmochromogens having the same spectrophotometric behaviour and, with the exception of (I), combine with globin to give methæmoglobin (cf. this vol. 9). P. W. C.

Flavin content of different organs of the eel. M. Fontaine (Compt. rend., 1937, **204**, 1367—1368).—The total flavin content of the eel, determined by Gourévitch's method (this vol., 209), increases with age from $1{\cdot}8$ to $5{\cdot}1 \times 10^{-4}$%. Blood and muscle contain <1, spleen 2—3, gills 3—4, heart 4—5·4, kidney 5, ovary 5·3—6, liver 7·5—10, and skin from the back 17—26 $\times 10^{-4}$%. J. L. D.

Determination of flavin in invertebrates. A. Gourévitch (Bull. Soc. Chim. biol., 1937, **19**, 125—129).—The flavin content of parasites (*e.g.*, *Ascaris*) was determined by measurements of fluorescence-excitatory power (cf. Karrer and Fritzsche, A., 1935, 1134). F. O. H.

Constitution of toxoflavin.—See A., II, 351.

Specificity of lactoflavin.—See A., II, 352.

Carotenoid pigments in organs of fishes. Carotenoid substances in cephalopods. E. Lönnberg (Ark. Zool., 1936, **28**, A, No. 15, pp. 7; **28**, B, No. 8, pp. 4).—(A) The eyes of certain fishes previously believed to contain no carotenoid pigments contain small amounts of xanthophyll. The blood of selachians appears to be very poor in carotenoids; the blood of teleosts contains the same xanthophyll-like pigments as do the eyes. Notes on the carotenoids in the liver of some teleosts are included.

(B) The eyes of *Sepiola scandica*, *Rossia macrosoma*, and *Eledone cirrosa*, and the liver of the last contain pigments with spectral absorption resembling that of xanthophylls. These pigments appear to be the same as those of the eyes of fishes. Nutr. Abs. (*m*)

Pigments and vitamin content of yolk of egg. F. Bílek (Wiss. Ber. VI Weltgeflügelkongr., 1936, **1**, 233—236).—The colour of the yolks of hens' eggs depends on the amount of pigment in the food (especially yellow maize, carrots, or lucerne meal). The vitamin-*A* content of the yolk ∝ the amount of pigment and the amount of cholesterol increases with increasing depth of colour. Nutr. Abs. (*m*)

Pigments of the retina. O. Brunner (Österr. Chem.-Ztg., 1937, **40**, 203—207).—The rôle played by vitamins, visual purple, and pigments of the retina (cf. A., 1936, 1287) in the visual processes is discussed. F. O. H.

Pigments associated with the fatty tissues of plants and animals. I. M. Heilbron (Proc. Roy. Inst., 1937, **29**, 531—547).—A lecture.

Indian snake venoms. I. Daboia venom: its chemical composition, protein fractions, and their physiological action. S. N. Ganguly and M. T. Malkana (Indian J. Med. Res., 1936, **23**, 997—1006).—The venom contains C, H, O, N, and S, but not P. Protein-N in the dried venom indicates 96·8% of protein; Et_2O extracts 2·8% of sol. lipins. The proteins consist of globulin (23·35%), albumin (22·12%), and proteoses (I) (50·52%); the secondary (I) are considered to be responsible for the neurotoxic, coagulant, and hæmorrhagic actions of the venom. Adsorption methods and pptn. with $(NH_4)_2SO_4$ or $COMe_2$ do not separate the fractions responsible for the above actions. R. N. C.

Protein nature of bee- and *Crotalus*-poisons. I. R. HAVEMANN and K. WOLFF (Biochem. Z., 1937, **290**, 354—359; cf. this vol., 9).—The amphoteric nature of the toxin (apitoxin) (I) and rattlesnake venom (crotalotoxin) (II) is indicated by cataphoresis. The isoelectric points of (I) and (II) are p_H 8·7 and 7·9, respectively. (I) is difficultly sol. at $p_H > 8·3$ and (II) is only slightly sol. in the region of its isoelectric point. Both (I) and (II) dialyse readily through collodion and parchment membranes. P. W. C.

Scorpion toxin. C. TETSCH and K. WOLFF (Biochem. Z., 1937, **290**, 394—397).—36·5 mg. of a colourless, highly toxic substance (S 3·8%, N 13·6%) is isolated as the hydrochloride from 150 scorpion stings. The substance appears in composition to be related to bee and snake poisons. P. W. C.

Nature of cerebrospinal fluid. Y. DERRIEN (Bull. Soc. Chim. biol., 1937, **19**, 649—663).—More detailed results confirm that the blood–cerebrospinal fluid equilibrium obeys Derrien's and not Donnan's law (cf. this vol., 54). P. W. C.

Determination of protein in cerebrospinal fluid. J. HEMPEL and L. GIESE (Klin. Woch., 1936, **15**, 1648—1649).—The method is based on the production of EtOH albuminates by treatment with different concns. of EtOH and subsequent measurement of the turbidity in a nephelometer. Normal fluid contains on the average 23 mg. of total protein per 100 ml. with a globulin : albumin ratio of 0·24. In untreated paralysis the vals. are 55 and 1·3, respectively, and in purulent meningitis 103 and 0·24. NUTR. ABS. (*m*)

Micro-determination of phosphorus in cerebrospinal fluid. C. TROPP, O. SEUBERLING, and B. ECKARDT (Biochem. Z., 1937, **290**, 320—326).—Methods are described for the determination of inorg., total, acid-sol., and lipin-P in cerebrospinal fluid and a table summarises the results in 10 patients. P. W. C.

Ionic equilibrium in milk. L. HABERS and H. J. C. TENDELOO (Proc. 5th Int. Cong. Tech. Chem. Agric. Ind., Holland, 1937, II, 285—290).—Potentiometric titration of skim-milk with NaOH and $Ca(OH)_2$ shows that more equivs. of the latter are required to reach the same p_H as the former. The addition of a neutral salt to milk increases the real and titratable acidity; with low concns. of the salt more $Ca(OH)_2$ than NaOH is required to reach a certain p_H but this difference vanishes with higher salt concns. Pptn. of Ca by C_2O_4'' shows a smaller difference between the titration with NaOH and $Ca(OH)_2$. The casein–phosphate complex is discussed. W. L. D.

Zeolites as analytical reagents for the examination of milk cations. W. L. DAVIES (Proc. 5th Int. Cong. Tech. Chem. Agric. Ind., Holland, 1937, II, 291—296).—$Ca^{··}$ in milk can be rapidly determined by the base-exchange method. Ca exchange in milk occurs in two phases, a rapid exchange of $Ca^{··}$ and a slow exchange of Ca liberated from complex combination by the disturbance of the $Ca^{··}$/combined Ca equilibrium. The appropriate zeolitic cations to use are those which do not interfere with the reaction of the milk during the exchanging process ($Mn^{··}$, $Ba^{··}$, $NH_4^{·}$). Partial pptn. of milk-Ca with C_2O_4'' is distributed between ionic and combined forms. 20% of small amounts of $Ca^{··}$ added to milk enters into the combined form. Increase in milk acidity increases $Ca^{··}$ and the rate of Ca exchange from the combined form, whilst increased alkalinity has the reverse effect except where the alkalinity is due to ions entering from alkali zeolites. W. L. D.

Source of the typical components of milk fats. Hypothesis suggested by recent work on their glyceride structure. T. P. HILDITCH (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, II, 367—383).—Depôt fats of animals contain a const. amount of palmitic (30%) but varying amounts (7—30%) of stearic acid and fully saturated glycerides of stearic acid. Milk fats contain lower saturated fatty acids but have a const. palmitic and varying oleic acid content. When pig depôt fat is hydrogenated, saturation of palmito-oleo- or trioleo-glycerides appears to occur. In milk secretion preformed oleoglycerides are, in part, converted into lower saturated fatty acid and stearic glycerides. This is based on the fact that both ω- and β-oxidation–reduction processes are possible with fats, and that small quantities of unsaturated acids of the C_{10}—C_{16} type with the double linking at 9 : 10 occur as fragments of transformed oleo-glycerides. The enzymic oxidation–reduction system would be interfered with if other reactive compounds are selectively adsorbed by the enzyme. Feeding of cod-liver oil, containing unsaturated C_{20} and C_{22} acids, to cows results in a diminished yield of milk fat and a gross alteration in fatty acid distribution owing to the disturbance of the normal oleo-glyceride breakdown by the presence of C_{20} and C_{22} acids. Such an interference is absent when feeding rape and linseed oils. W. L. D.

Protein fractions, casein and soluble albumin, in human milk : effect of fat on casein precipitation. A. BIEBER (Riv. Clin. pediat., 1936, **34**, 866—881).—The proportion of casein to other proteins does not alter during the course of lactation. NUTR. ABS. (*m*)

Determination of ammonia in milk. S. NIEMCZYCKI and K. GERHARDT (Lait, 1936, **16**, 1049—1061).—The NH_3 content of cow's milk is best determined by the method of Parnas (A., 1925, i, 323) for blood-NH_3. The average val. is 0·75 mg. of NH_3 per litre of fresh milk (range 0—2·18 mg.). The NH_3 content of milk increases as a result of bacterial proteolysis, and hence is an important indicator of quality. NUTR. ABS. (*m*)

Elimination of nickel in the bile. F. CAUJOLLE (Bull. Soc. Chim. biol., 1937, **19**, 342—352).—The elimination of Ni in the bile of dogs injected with aq. $NiCl_2$ under chloralose anæsthesia is < that of Co under analogous conditions (A., 1936, 1415). A. L.

Destruction of digitalis substances by gastric juice. I. F. ŠVEC (Arch. exp. Path. Pharm., 1937, **185**, 57—70).—Almost complete destruction of digitalis substances occurs in HCl solution at p_H 1·25 and in gastric juice, the latter reaction being dependent on p_H and on the colloid content but being independent of the pepsin content. P. W. C.

Pituitary control of alimentary blood flow and secretion. (A) Changes in stomach produced by administration of posterior pituitary extract. E. C. Dodds, R. L. Noble, R. W. Scarff, and P. C. Williams. **(B) Effect of posterior pituitary extract on alimentary secretions of intact animals. (C) Effect of alterations in blood flow on gastric secretion. (D) Gastric secretion and blood flow in hypophysectomised animals.** W. C. Cutting, E. C. Dodds, R. L. Noble, and P. C. Williams (Proc. Roy. Soc., 1937, B, **123**, 22—26, 27—38, 39—48, 49—59; cf. A., 1935, 902).—(A) Injection of a posterior pituitary extract produces a severe lesion in the acid-bearing area of the stomach of rabbits and other animals. A similar lesion is produced by $BaCl_2$.

(B) Stimulation of gastric secretion in cats, produced by histamine, insulin, sham feeding, or pilocarpine, is inhibited by the vasopressor fraction of posterior pituitary extract and by other vasoconstrictors. The vol. but not the acidity of the juice is reduced.

(C) Gastric secretion is dependent on (*a*) stimulus and (*b*) an adequate blood flow to the stomach, but is not induced by either factor alone.

(D) In hypophysectomised animals the gastric secretion and blood flow differ markedly from the normal and the acid–vol. relationship is destroyed. A substance, secreted in the posterior lobe, essential for the normal regulation of secretion is indicated.

E. M. W.

Effect of various degrees of anoxæmia on secretion of acid and chlorides by the stomach. C. K. Sleeth and E. J. van Liere (Proc. Soc. Exp. Biol. Med., 1937, 36, 208—211).—In barbitalised dogs and cats, anoxæmia reduces the gastric secretion of acid and Cl′, only when it is more intense than that produced by breathing air with an O_2 partial pressure of 53 mm. Hg. W. O. K.

Hæmatological studies in Indians. IV. Fractional gastric analyses in normal Indians. L. E. Napier and C. R. Das Gupta (Indian J. Med. Res., 1935, **23**, 455—462).—Gastric acidity is generally > in normal Europeans, and achlorhydria is rarer. Acidity in males is > in females. R. N. C.

Determination of calcium in urine and fæces by Aron's method. G. Hammarsten (Skand. Arch. Physiol., 1936, **75**, 189—194).—Aron's method (A., 1907, ii, 652) is applicable to the determination of Ca in the urine and fæces of rats in metabolism experiments. The presence of significant amounts of Si vitiates the results and the correct proportions of H_2SO_4, H_2O, and EtOH must be used. Org. matter of the fæces and urine is first destroyed with H_2SO_4 and HNO_3. Nutr. Abs. (*m*)

Treatment of urinary infection: importance of dietary control. H. I. Coombs, C. H. Catlin, and D. Reader (Lancet, 1937, **232**, 1043—1046).—Urine can be rendered and maintained relatively alkaline or acid by administration of suitable diets. Acid- and alkali-producing foods are tabulated.

L. S. T.

Treatment of urinary infections with calcium mandelate. E. Schnohr (Lancet, 1937, **232**, 1104—1105).—Treatment with Ca mandelate is as effective as those with other preps. of the acid.

L. S. T.

Sugar content of normal urine and its relation to normal blood-sugar. K. N. Bagchi and M. N. Rudra (J. Indian Med. Assoc., 1936, **6**, 130—134).—The following average vals. (mg. per 100 ml.) for blood- (I) and urine-sugar (II) were found: Bengalees 104, 85; Biharis 118, 93; Oriyas, 123, 90; Hindus 113, 89; non-Hindus (non-vegetarian) 104, 87; vegetarians (Hindus) 123, 93; non-vegetarians 110, 88. There was a correlation between (I) and (II) but not between age and (I) or (II). Nutr. Abs. (*m*)

Creatine and creatinine excretion in infancy. R. Catherwood and G. Stearns (J. Biol. Chem., 1937, **119**, 201—214).—The urinary vals. are statistically correlated with body-wt., length, and age. The data support the conclusions that exogenous sources are without consistent influences on either substance, that creatinine excretion is almost exactly a function of the muscular tissue-wt., whilst creatine excretion depends mainly on the metabolic rate. The creatine vals. are the lower and the more irregular.

R. M. M. O.

Determination of porphyrin [in urine] with the Leifo photometer. K. Franke (Z. ges. exp. Med., 1936, **97**, 616—621; Chem. Zentr., 1936, i, 3551).—Exact determinations of 2·5—250 $\times$ 10^{-6} g. per 100 c.c. can be made by means of calibration curves. The extraction of porphyrin from urine is described. H. J. E.

Spectrographic examination of urinary and biliary calculi. S. Ranganathan and N. K. De (Indian J. Med. Res., 1935, **23**, 237—238).—Stones from different species show the spectra of a no. of elements, mostly metallic. R. N. C.

Solubility of aragonite in salt solutions.—See A., I, 407. N. M. D.

Humoral medicine and chemistry. A. Lumière (XIV Congr. Chim. ind., 1934, Comm. 2, 15 pp.; Chem. Zentr., 1936, i, 3363).—A " neo-humoral pathology " is developed on the basis of colloid science.

H. N. R.

Blood- and urinary amylase in man. S. H. Gray and M. Somogyi (Proc. Soc. Exp. Biol. Med., 1937, **36**, 253—255).—In normal subjects the urine- : blood-amylase ratio is 2—6 : 1. The ratio is unaltered in acute pancreatitis although the abs. vals. increase; it may be reversed in kidney disturbances such as often occur in scarlet fever. P. G. M.

Influence of gastric acidity and degree of anæmia on iron retention. A. P. Barer and W. M. Fowler (Arch. Int. Med., 1937, **59**, 785—792).—Achlorhydria decreases the retention of Fe when dietary intakes of Fe are normal but not when large doses of Fe are orally administered. The retention is not increased by addition of HCl to the diet nor influenced by anæmia. A dietary intake of 6·7 mg. of Fe per day gives a negative Fe balance in anæmic patients. F. O. H.

Tryptophan and histidine in the blood in Biermer's anæmia. Amino-acids in the blood in Biermer's anæmia or anæmia following

hæmorrhage. L. Tochowicz (Folia hæmatol., 1936, **56**, 240—248, 249—268).—Data are given on the tryptophan and histidine content of normal serum and serum of pernicious and post-hæmorrhagic anæmia cases, fasting or following administration of peptone, beef, or liver-protein. Nutr. Abs. (*m*)

Detection of Castle's enzyme in gastric juice of adults and children. E. L. Rauschenberger (Z. ges. exp. Med., 1936, **97**, 514—522; Chem. Zentr., 1936, i, 3350).—The enzyme is detected by its effect on the reticulocyte count in rats. It is absent from the gastric juice in pernicious anæmia. Concn. of the juice activates the enzyme. A. G. P.

Cobalt content of iron compounds and its possible relation to anæmia. E. J. Underwood (Proc. Soc. Exp. Biol. Med., 1937, **36**, 296—299).—Common sources of Fe contain up to 119 p.p.m. of Co. This may be significant in Fe therapy of anæmia. P. G. M.

Effect of pancreatic tissue extract on cholesterol of blood in cardiovascular arteriosclerosis. A. Samuelson (Proc. Soc. Exp. Biol. Med., 1937, **36**, 372—375).—A transitory decrease in blood-cholesterol, lasting approx. 24 hr., occurs within 1 hr. of treatment. H. G. R.

Physiological aspects of the cobalt problem [in animal nutrition]. M. E. Bell (New Zealand J. Sci. Tech., 1937, **18**, 716—719).—An anæmia often accompanies and accentuates sheep sickness, although the latter may occur independently of anæmia. Sick animals retain their ability to produce insulin, to use org. acids to neutralise bases, and to use glycuronic acid to neutralise toxins. A. G. P.

Vitamins in cancer therapy. T. Gordonoff and F. Ludwig (Schweiz. med. Woch., 1936, **66**, 1129—1130).—The growth of cancer tissue *in vitro* is inhibited in plasma lacking vitamin-*A* or -B_1, but is normal in plasma free from -*C*, -*D*, or -*E*. Plasma containing excess of -*A* or -B_1 causes very active growth; excess of -B_2 has a slightly accelerating effect whilst excess of -*C*, -*D*, or -*E* has none. Nutr. Abs. (*m*)

Effect of *X*-rays on the metabolism of tumour tissue. G. Bancroft and V. E. Kinsey (Biochem. J., 1937, **31**, 974—979).—Using the methods of Elliot and Schroeder (A., 1934, 1394) it is found that *X*-rays produce a definite decrease of the R.Q. of Philadelphia rat sarcoma No. 1 *in vitro* similar to that previously observed *in vivo* (A., 1935, 1525) and an increase in aërobic acid formation (chiefly lactic) indicating that the lowered R.Q. is not due to incomplete oxidation with formation of acids other than lactic. Under conditions which produce a pronounced lowering of R.Q. of tumour tissue, *X*-rays have no measurable effect on the metabolism of rat kidney slices. *X*-Rays probably attack the process of carbohydrate oxidation before the $AcCO_2H$ stage. P. W. C.

Effect of diets containing various fish eggs on the growth of tumour in rats. S. Tokuyama and W. Nakahara (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, **32**, 50—55).—Fish roes cause more rapid growth than horse flesh, probably due to their high arginine and low lysine content. Slow growth with herring-roe diets is anomalous. F. R. G.

Influence of diets containing proteins of various *Arthropoda* on the growth of tumours in rats. S. Tokuyama and W. Nakahara (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, **31**, 335—341; cf. this vol., 12, 122).—Groups of rats fed on diets containing the proteins of the silkworm, horse, crab, lobster, and grasshopper showed growth rates in the ratio of 0·5 : 1·0 : 0·7 : 0·5 : 0·1 whereas after inoculation, tumour growth occurred in the ratio 2·2 : 1·0 : 0·6 : 0·5 : 0·3. It is suggested that the rate of tumour growth is directly ∝ the arginine and inversely ∝ the lysine content of the diet. J. L. D.

Production of sarcoma in rats as a result of feeding crude wheat-germ oil. G. M. Dorrance and E. F. Ciccone (Proc. Soc. Exp. Biol. Med., 1937, **36**, 426—427).—The time of development of the tumours decreased with increasing amounts of oil. H. G. R.

Neoplasms in rats resulting from the feeding of crude wheat-germ oil made by ether extraction. L. G. Rowntree, J. Lansbury, and A. Steinberg (Proc. Soc. Exp. Biol. Med., 1937, **36**, 424—426).—The abdominal sarcoma which developed retained its malignancy through 6 successive implantations. H. G. R.

Effect of injections of rhenium on the growth of tumours in mice. N. Dobrovolskaia-Zavadskaia and A. Raynaud (Compt. rend. Soc. Biol., 1937, **125**, 353—355).—No effect on tumour growth was observed. H. G. R.

Action of intravenous trypsin, carcinolysis, and serum-protein complex. W. Raab (Z. ges. exp. Med., 1936, **97**, 588—609; Chem. Zentr., 1936, i, 3348—3349).—Man is more sensitive than the dog to trypsin (I) action. The effect of (I) on carcinomatous cells *in vitro* diminishes rapidly and ceases after 12 hr. Pretreatment of the animal induces a "(I)-immunity." In carcinomatous dogs the ratio albumin : globulin in sera averages 0·74 (normal, 1·11). (I) dosage modifies the ratio in healthy but not in carcinomatous animals. A. G. P.

Magnetic susceptibility of normal and pathological serum. R. Jonnard (Compt. rend., 1937, **204**, 1220—1222).—Human blood is diamagnetic. The normal val. ($-6{\cdot}39$ to $-7{\cdot}9 \times 10^{-7}$ at 20°) of κ is increased in cancer. F. O. H.

Composition of enamel, dentine, and root in caries and pyorrhœa. M. M. Murray and J. H. Bowes (Brit. Dent. J., 1936, **61**, 473—477).—Pyorrhœtic enamel has less ash and Ca and more N and P whilst carious enamel has more CO_2 than sound enamel. Compared with sound dentine, pyorrhœtic dentine has a slightly increased and carious dentine a greatly increased Mg content. Diseased but not the sound dentines contain Cl. The Mg content of carious roots is normal but that of pyorrhœtic roots is high. More information is gained from "corrected" than from ordinary Ca : P ratios, the "corrected" ratio being (Ca + Ca equiv. of Mg)/P. Nutr. Abs. (*m*)

Factors in human saliva correlated with the presence and activity of dental caries. M. Karshan (J. Dent. Res., 1936, **15**, 383—393).—In persons free from caries or with arrested caries the Ca content of artificially stimulated saliva was 6·1 mg. per 100 ml., whilst in persons with active caries or with similar conditions the val. was 5·3 mg. The corresponding CO_2 capacities were 30 and 20 vols. per 100 ml. respectively. The proportions of Ca removed by shaking with $Ca_3(PO_4)_2$ were approx. 65% and 45% respectively. Vals. for NH_3-N did not differ significantly. Nutr. Abs. (*m*)

Biochemistry of the lens. IX. Influence of vitamin-*C* and thiol compounds on production of galactose cataract. J. Bellows. **X. Preparation of glutathione from the crystalline lens.** J. Bellows and L. Rosner (Arch. Ophthalmol., 1936, **16**, 762—769, 1001—1003).—IX. Rats receiving a diet containing 70% of galactose (I) show opacities in the lens in 7 days but, if vitamin-*C* is given in addition, the appearance of changes in the lens is delayed. Administration of yeast, or of cystine, delays the appearance of cataract for 20—30 days. In the lenses of rats receiving galactose diets there is less glutathione (II) and -*C* than in lenses from normal rats. (I) apparently reduces the thiol content of the cryst. lens.

X. A cryst. substance, closely resembling (II), is extracted from ox lenses by a mixture of EtOH, Et_2O, and H_2SO_4 (yield 0·2 g. from 200 lenses). Nutr. Abs. (*m*)

Lachrymal elimination of glucose in diabetics. D. Michail, P. Vancea, and N. Zolog (Compt. rend. Soc. Biol., 1937, **125**, 194—195).—The tears of diabetics contain 0·032—0·084% of glucose, no correlation being observed between this val. and that of the blood-sugar. H. G. R.

Iodine in the blood of diabetics. M. Yagishita (Mitt. med. Akad. Kioto, 1936, **18**, 1201—1206).—The I content of the blood of normal subjects of both sexes in spring and winter is 0·0094 mg. per 100 ml. That of the blood of diabetics is variable (max. 0·0165 mg. per 100 ml.). Lowest vals. are given in cases complicated by tuberculosis. Nutr. Abs. (*m*)

Blood-sugar following injection of insulin during absorption of glucose in normal and diabetic subjects. O. Postranecky (Presse méd., 1935, No. 43).—In health, alimentary hyperglycæmia is not affected by administration of insulin but in diabetes the sugar content of the blood is decreased and that of the liver is increased. Nutr. Abs. (*m*)

Arterio-venous sugar difference in diabetes mellitus: its value in adjudging the severity of the disease. J. P. Bose (Indian J. Med. Res., 1935, **23**, 1—20).—The arterio-venous sugar difference, which is positive in normal subjects and mild cases of diabetes, becomes zero or negative in more severe cases, the extent of the decrease depending on the degree of severity. The difference rises rapidly in normal subjects after a meal of glucose (I), reaching a max. in 1 hr. In mild cases the max. difference after a meal of (I) is still positive but < in normal subjects, whilst in more severe cases it is often negative. R. N. C.

Ammonia coefficient of the urine in treated cases of diabetes mellitus. Effect of diet. J. L. Rennie (Glasgow Med. J., 1936, **126**, 323—328).—The coeff., calc. from the formula 100 × urinary NH_3-N/(NH_3-N + urea N), is ≯5 in healthy individuals. High coeffs. are more frequent following treatment with low- or medium-carbohydrate diet with and without insulin. Special treatment with high-carbohydrate low-fat diets maintains the coeff. at approx. normal level. Fruit is not more effective than are other forms of carbohydrate in lowering the coeff. Nutr. Abs. (*m*)

Protein fractions of blood sera. IV. Epidemic dropsy. R. N. Chopra, S. N. Mukherjee, and J. C. Gupta (Indian J. Med. Res., 1935, **23**, 353—357).—Relative η and σ are < their normal vals. in sera of patients with epidemic dropsy. Buffer action is also < normal, although p_H remains unaltered. Albumin (I) is decreased whilst globulins, particularly pseudoglobulin, are increased. The decreases of η and buffer action, and also the disturbance of the fluid exchange between the blood and tissues, are associated with the fall in (I). R. N. C.

Arachidonic and linoleic acids of the serum in normal and eczematous subjects. W. R. Brown and A. E. Hansen (Proc. Soc. Exp. Biol. Med., 1937, **36**, 113—117).—Arachidonic and linoleic acids occur in the serum of normal children to the extent of 3 and 5% respectively of the total fatty acids. Vals. are lower in eczema. P. G. M.

Carbohydrate metabolism in epilepsy. L. J. Pollock and B. Boshes (Arch. Int. Med., 1937, **59**, 1000—1023).—The fasting levels for blood-sugar and the oral tolerance test were normal. Insulin hypoglycæmia appeared to be followed by a slow recovery. H. G. R.

Adsorptive action of colloidal aluminium hydroxide. H. Lodenkämpfer (Z. ges. exp. Med., 1936, **97**, 708—714; Chem. Zentr., 1936, i, 3361).—Elimination of HCl from the stomach in hyperacidity by colloidal $Al(OH)_3$ is due to adsorption and not to chemical neutralisation. A. G. P.

Hypoglycæmia with paradoxical sugar tolerance curve simulating peptic ulcer. A. R. Peskin (J. Amer. Med. Assoc., 1937, **108**, 1601—1603).—The hypoglycæmia described causes symptoms similar to peptic ulcer but produces an abnormal sugar tolerance curve and gastric hypoacidity. E. M. W.

Isolation and properties of the factor responsible for increased capillary permeability in inflammation. V. Menkin (Proc. Soc. Exp. Biol. Med., 1937, **36**, 164—167).—A H_2O-sol., thermostable, cryst. substance "leukotaxine," isolated from the exudate of inflamed tissue, contains 2·3% of N, is dialysable, free from protein and carbohydrate, and may be an NH_2-acid. It increases the permeability of capillaries and exerts a chemotactic attraction on leucocytes. W. O. K.

Serum-phosphatase in jaundice. A. Cantarow and J. Nelson (Arch. Int. Med., 1937, **59**, 1045—1050).—No distinction was observed between obstructive and hepato-cellular jaundice. H. G. R.

Blood-heparin and lipin amino-nitrogen in experimental obstructive jaundice. L. M. Hellman, R. A. Moore, and W. De W. Andrus (Proc. Soc. Exp. Biol. Med., 1937, **36**, 176—178).—In dogs suffering from obstructive jaundice as the result of ligation and division of the common duct, there is no significant change in blood-heparin, but there is a progressive fall in blood-lipin NH_2-N, most of which represents kephalin. W. O. K.

Influence of protein feeding on the nitrogenous blood constituents in dogs after experimental kidney lesion. L. Sas (Biochem. Z., 1937, **290**, 304—312).—In dogs in which slight kidney lesion had been effected by administration of $UO_2(NO_3)_2$, the changes in blood-N vals. on protein feeding closely resemble those (A., 1936, 356) in normal dogs. Only in the starved dog was increase of residual N (by 35%) and urea-N (83%) obtained. P. W. C.

Nitrogen and sulphur metabolism in Bright's disease. VIII. Effect of ingestion of urea on nitrogen excretion and sulphur partition in nephrosis, glomerulo-nephritis, and cirrhosis of the liver. G. P. Grabfield and B. Prescott (Arch. Int. Med., 1937, **59**, 823—836).—Data for the intake of N and S and their distribution in urine and fæces indicate changes in protein metabolism mainly affecting the S-containing constituents of the protein mol. F. O. H.

Standardisation of liver extracts. J. Dedichen (Acta med. scand., 1936, **90**, 195—206).—Leucocytosis, possibly due to anti-anæmic factor, follows injection of potent, protein-free liver extracts into healthy adults and pigs (but not rabbits, dogs, or sheep). Inactive fractions cause no significant increase in leucocytes. No leucocytosis follows injection of the extracts into patients with liver disease. Nutr. Abs. (*m*)

Cirrhosis of the liver following chronic intoxication with carbon tetrachloride : experimental study. M. V. R. Rao (Indian J. Med. Res., 1936, **23**, 1007—1014). R. N. C.

Phosphatase activity, inorganic phosphorus, and calcium of serum in disease of liver and biliary tract. C. A. Flood, E. B. Gutman, and A. B. Gutman (Arch. Int. Med., 1937, **59**, 981—999).—Serum-phosphatase is increased in jaundice due to obstruction of the biliary duct but is variable in catarrhal jaundice or hepatitis. An increase occurs in carcinoma with metastases of the liver. No variation was observed in serum-inorg. P or -Ca. H. G. R.

Hyperglycæmia due to impaired hepatic glycogenesis. J. W. Conn and L. H. Newburgh (Proc. Soc. Exp. Biol. Med., 1937, **36**, 236—238).—In certain middle-aged obese patients with glycosuria, oxidation of sugar following a test meal was normal although the blood-sugar curve was of the diabetic type. It follows that the defect was in the storage of carbohydrate by the liver, not in its oxidation. These patients became normal after the obesity was reduced by dieting. W. O. K.

Glycine treatment of progressive muscular dystrophy. W. Borst and W. Möbius (Z. klin. Med., 1936, **129**, 499—511; Chem. Zentr., 1936, i, 3536).—Of four cases examined administration of glycine improved muscle metabolism (increased elimination of creatine) only in two, and caused clinical improvement only in one. A. G. P.

Chemotherapy. IV. Sulphonamide compounds in coccic infections. S. M. Rosenthal, H. Bauer, and S. F. Branham. **V. Sulphanilamide, serum, and combined drug and serum in experimental infections in mice.** S. E. Branham and S. M. Rosenthal (U.S. Publ. Health Rep., 1937, **52**, 662—671, 685—695).—IV. Sulphanilamide (I) is effective against pneumococcal infections and is more effective in rats than in mice and rabbits. Disulphanilamide, which is ~20% more toxic than (I), is more effective than (I) against streptococcal infections in mice. Both amides are more effective than proprietary drugs. The effectiveness of the drugs when given parenterally or orally depends on their rates of excretion in the urine.

V. (I) shows a marked therapeutic action in mice experimentally infected with meningococci. Best results are obtained by combined drug and serum treatments, which are also effective against pneumococcal infections. W. L. D.

Effect of calcium and vitamins-*A* and -*D* on incidence of pregnancy toxæmia. G. W. Theobald (Lancet, 1937, **232**, 1397—1399). L. S. T.

Non-protein-, urea-, and residual nitrogen of the blood during normal pregnancy and the puerperium. J. F. Cadden and A. M. Faris (Amer. J. Obstet. Gynecol., 1936, **32**, 421—428).—In pregnant women the non-protein-N content of the blood at the end of the 6th month is 24 mg. per 100 ml., at parturition it is 26 mg., and one week later it is 33 mg. The urea-N content decreases during the first 6 months from 14 to 6 mg. per 100 ml.; at term it is 7 mg. and on the 8th day post partum 11 mg. The residual N content decreases to 18 mg. per 100 ml. during the first 6 months, increases to 19 mg. at term, and is 21 mg. on the 8th day post partum. The ratio urea-N : non-protein-N is 0·5 for non-pregnant women. In pregnancy it is 0·25 at the 6th month and 0·27 at term. Nutr. Abs. (*m*)

Intra-uterine carbohydrate metabolism. B. Szendi (Monatsschr. Kinderheilk., 1936, **66**, 128—136).—The glycogen (I) contents of human decidua and placenta increase rapidly to 4% and 2% respectively at the 20th day of conception and decrease to <1% at the 30th day. The (I) content of fœtal lungs reaches a max. of approx. 1·3% at the 27th day, after which it decreases to approx. 0·4% at the 30th day, and that of fœtal liver increases from approx. 0·2% at the 27th day to a max. of 2·75% on the 32nd day. Similar results are obtained in rabbits. Nutr. Abs. (*m*)

Cells of the adrenal cortex of the ewe during the œstrual cycle and pregnancy. L. J. Nahm and F. F. McKenzie (Missouri Agric. Exp. Sta. Res. Bull., 1937, No. 251, 20 pp.).—The dark cells, which appear in larger nos. during late œstrus and early and late pregnancy, contain at these times increased amounts of lipins which probably represent material

to be used in the production of secretion. Chondriosomes may also be used to produce secretion or other reserve material. A. G. P.

Phosphorus components in the blood of normal and rachitic infants. H. Bakwin, O. Bodansky, and R. Turner (Proc. Soc. Exp. Biol. Med., 1937, **36**, 365—368).—Decreased acid-sol. P in rickets involves inorg. PO_4''', acid-hydrolysable P, and the fraction not hydrolysable by bone-phosphatase. H. G. R.

Geochemistry applied to the problems of silicosis.—See A., I, 433.

Treatment of streptococcal infections in mice with 4 : 4′-diaminodiphenylsulphone. G. A. H. Buttle, D. Stephenson, S. Smith, T. Dewing, and G. E. Foster (Lancet, 1937, **232**, 1331—1334).—The sulphone cures streptococcal infections in mice in doses approx. 0·01 of those required with p-$NH_2{\cdot}C_6H_4{\cdot}SO_2{\cdot}NH_2$ (I); it is much more toxic in mice but not in rabbits or monkeys. It is more active in producing methæmoglobinæmia in monkeys. 4 : 4′-Dinitrodiphenylsulphone is as effective as (I), but is less toxic to mice. L. S. T.

Physico-chemical changes in blood in experimental thrombopœnic purpura. L. M. Tocantins (Proc. Soc. Exp. Biol. Med., 1937, **36**, 402—406).—A moderate decrease in η, correlated with a decrease in cell vol., together with a transient increase in non-protein-N were observed. H. G. R.

Indications of liver damage during thyrotoxicosis. E. Gorodetski and P. T. Schesterikova (Ukrain. Biochem. J., 1937, **10**, 127—141).—In Basedow's disease, the serum complement is sometimes decreased, the serum contains a lipase resistant to quinine, and the urinary NH_2-acid concn. (normally 2—5%) is increased to 12—16%. These findings indicate liver damage. W. O. K.

Nitrogen and mineral metabolism during a chronic case of *Trypanosoma congolense* disease in an ox. M. H. French (Ann. Rep. Dept. Vet. Sci., Tanganyika, 1935 (1936), 73—77).—Metabolism studies indicate that the disease is accompanied by acidosis. There is increased output of N, Ca, K, and P. Na and Cl excretion is increased when these elements are given in small quantities. Mg metabolism appears to be unaltered. Nutr. Abs. (*m*)

Nitrogen and mineral metabolism during acute infections of sheep with *Trypanosoma brucei*. M. H. French (Ann. Rep. Dept. Vet. Sci., Tanganyika, 1935 (1936), 77—81).—Infection with *T. brucei* causes increased excretion of N, Ca, and K in sheep on different nutritional levels. P metabolism remains unaffected. Elimination of Na and Cl varies with the level of intake. Adequate NaCl consumption is followed by increased retention of both elements, whereas on a low intake there is an increased rate of excretion. The Mg balance is unaltered. Nutr. Abs. (*m*)

Effect of the vitamin-*B* complex from liver on tubercular patients. M. Ishii (Bull. Inst. Phys. Chem. Res. Japan, 1937, **16**, 265—294).—Nine out of 10 patients in the third stage of pulmonary tuberculosis responded, by a general improvement in strength, appetite, red cell count, and hæmoglobin content, to the daily oral administration for 10—15 months of a vitamin-*B* adsorbate prepared from 75 g. of ox liver (cf. A., 1934, 1415). J. L. D.

Action of ethyl esters of certain saturated fatty acids on the development of experimental tuberculosis in the guinea-pig. L. Nègre, A. Berthelot, and J. Bretey (Compt. rend., 1937, **204**, 1372—1374).—Twice-weekly, subcutaneous injections of 0·5 c.c. of Et arachidate, palmitate, myristate, laurate, and decoate retard the appearance of tuberculosis in injected guinea-pigs (cf. this vol., 59). Et octoate and hexoate are without effect. Et butyrate sensitises the animals to infection, whilst the benzyl and cinnamyl esters do not. J. L. D.

Effect of tuberculin and of acetone and methyl-alcoholic extracts on the pathogenic power of *BCG* and the action of these substances *in vivo*. F. Le Chuiton, J. Sabrazès, C. Berge, J. Pennaneac'h, and J. Dubreuil (Compt. rend. Soc. Biol., 1937, **125**, 441—444).—Contrary to the results obtained with strain 6*a* (cf. *ibid.*, 1936, **123**, 581), no increase in the pathogenic power was observed. H. G. R.

[Automatic] apparatus for measurement of metabolic rate of small animals. N. T. Werthessen (J. Biol. Chem., 1937, **119**, 233—239). R. M. M. O.

Metabolism of anæsthetised rats. M. Kleiber and F. J. Saunders (Proc. Soc. Exp. Biol. Med., 1937, **36**, 377—380).—Anæsthesia (amytal) is not recommended in metabolism determinations. H. G. R.

Basal metabolism of older women. H. McKay and M. B. Patton (Ohio Agric. Exp. Sta. Bull., 1936, No. 575, 16 pp.).—Basal metabolism is fairly uniform in women aged $\geq$50 years. Subsequently heat production declines. A. G. P.

Deamination and specific dynamic action. A. Szakáll (Biochem. Z., 1937, **291**, 122—137; cf. A., 1934, 554).—In dogs receiving intravenous injections of glycine, alanine, and glutamic acid (I) there is no relation between the amount of N thus given, the extent of deamination of these acids, and the increase in basal metabolism. This increase begins long before and is already falling off when deamination is at its max. Deamination is a consequence, not a cause, of the increased biological oxidation which follows administration of NH_2-acids. The increased oxidation is probably due to stimulation of the liver by the acids. (I) interferes with the activity of the liver and hence does not increase oxidation. W. McC.

Respiration of animal tissues. Unification of two opposing theories. W. Brandt (Chem.-Ztg., 1937, **61**, 465—467).—The respiratory mechanisms of Warburg and Keilin, Wieland, and Szent-Györgyi are discussed with special reference to the metabolism of oxalacetic acid. F. O. H.

Respiratory changes in pigeons due to alimentary disequilibrium of carbohydrate origin. R. Lecoq and J. M. Joly (Bull. Soc. Chim. biol., 1937,

19, 144—157).—Diets containing glucose, galactose (I), and fructose (II) but free from vitamin-*B* diminish the R.Q. and increase the basal metabolism of pigeons. Similar effects are produced by -*B*-rich diets containing 66% of (I) or 80—84% of (II) (cf. A., 1936, 904). F. O. H.

Measurement of tissue glycolysis in serum. M. Dixon (Biochem. J., 1937, **31**, 924—933).—The method of Dixon and Keilin (A., 1933, 629) is adapted to the determination of respiration and glycolysis of tissues in serum, and makes use of the CO_2 retention principle of Dickens and Simer (A., 1932, 644). P. W. C.

Muscle-hæmoglobin *in vivo*; instantaneous measurement of muscle metabolism. G. A. Millikan (Proc. Roy. Soc., 1937, **B**, **123**, 218—241).—Muscle-hæmoglobin acts as a short-time O_2 store, 1·3—3·5 cu.mm. per g. of muscle per sec. being required during max. tetanic contraction of cat's soleus muscle. During the contraction, the O_2 demand reaches a max. within 1 sec. and returns to the resting val. within 10 sec. of the end of the contraction. H. G. R.

Effect of dietary protein on the composition of the proteins of blood. K. Lang (Biochem. Z., 1937, **291**, 174—177).—In man the protein content (especially the albumin) of the blood-serum is increased by administration of gelatin but the oxyproline content is not affected. W. McC.

Relation between diet and changes in the albumin content of blood-serum in birds. M. L. Rochlina and A. S. Katznelson (Bull. Biol. Med. exp. U.R.S.S., 1936, **1**, 209—210).— In hens the albumin (I) content of the serum is higher and the egg yield greater when the normal basal ration is supplemented with vitamin-*A* and -*D* than when the basal diet alone is given, when it is supplemented with -*A* only, or when an acid or alkaline ration supplemented with -*A*, -*D*, and -*E* is given. The (I) val. and egg yield are lowest when the basal diet alone is given. The amounts of the vitamins in the rations do not affect the (I) level very greatly, but the absence of -*D* and -*E*, and abnormal acidity or alkalinity of the ration, reduce the egg laying capacity. In cocks no notable variations in (I) are observed. In pigeons serum-protein is little affected by different diets. The serum-protein level varies considerably in different species of birds but variations within any one species are slight. Nutr. Abs. (*m*)

Course of the excretion of various substances in exogenous protein catabolism. E. F. Terroine and J. Firdman (Bull. Soc. Chim. biol., 1937, **19**, 259—291).—The urine of a man during regular H_2O intake was examined at hourly intervals before and after a protein meal. 11 hr. after the meal 41—50% of the total N intake was excreted, the curve of excretion against time showing a max. after 7 hr. The max. in the curve of urea excretion came after that of NH_2-acids and NH_3, which ran parallel throughout. Excretion of uric acid and the coeff. of protein oxidation [urea-N/(urea-N + NH_2-acid-N + NH_3-N)] were the same as before the meal. A. L.

U** (A., III.)

Protein supplements in poultry rations. Effect of different sources of vitamin-*D* on the laying bird.—See B., 1937, 725.

Absorption of rice and atta protein in digestion and the question of the fæcal residue as a medium for intestinal putrefaction. H. E. C. Wilson and S. L. Mookerjee (Indian J. Med. Res., 1935, **23**, 483—489).—Intestinal putrefaction is not increased in healthy conditions on a rice diet, which yields a larger residue of fæcal N than atta protein. There is no evidence of a preferential absorption of S-containing NH_2-acids. R. N. C.

Possible factors in the causation of vesical calculus in India. Composition of the human urine on different diets. H. E. C. Wilson and S. L. Mookerjee (Indian J. Med. Res., 1935, **23**, 491—499).—The urine vol. on an atta diet is < on a rice diet, due to a lower salt intake; this may be accentuated by salt loss through perspiration. C_2O_4'' and PO_4''' excretion are increased on an atta diet; enough Ca is excreted to form an insol. salt with all the C_2O_4''. R. N. C.

Cheap "well-balanced" diets. W. R. Aykroyd and B. G. Krishnan (Indian J. Med. Res., 1936, **23**, 731—739).—The results of rat growth tests and chemical analyses of a no. of diets are given. R. N. C.

Biological value of the proteins of green-gram (*Phaseolus mungo*) and lentil (*Lens esculenta*). I. Balance sheet method. II. Growth of young rats. K. P. Basu, M. C. Nath, and M. O. Ghani (Indian J. Med. Res., 1936, **23**, 789—810, 811—826).—I. The metabolic N of the fæces of rats fed on green-gram or lentil is composed of two fractions dependent respectively on body-wt. and food intake. The biological vals. at 5%, 11%, and 15% levels of feeding are 63, 52, and 45 respectively for green-gram, and 53, 32, and 25 for lentil, the vals. decreasing as protein concn. in the diet increases. The protein val. of green-gram is 10·4 and of lentil 6·5 at a 10% level of intake. The proteins of the two pulses show no supplementary relation.

II. Growth per g. of protein ingested at 15% and 10% concns. of protein in the diet is 1·23 and 1·16 respectively for green-gram, and 0·94 and 0·59 for lentil. With 5% of protein, animals just maintain their wt. with the green-gram protein, but lose wt. with the lentil protein. With 15% of green-gram protein, growth is almost as efficient as on a diet of milk and whole wheat. Lentil proteins cause loss of fur, which is prevented by addition of 0·2% of cystine to the diet. Rats of 50—80 g. wt. require 9 g. of protein from these pulses for maintenance for 8 weeks. R. N. C.

Relation between the composition of the diet and the urinary excretion of ascorbic acid. R. K. Chakraborty and A. N. Roy (Indian J. Med. Res., 1936, **23**, 831—836).—A high-fat diet (butter) or a high-protein diet (casein or meat) produces a significant increase in the daily urinary excretion of ascorbic acid. R. N. C.

Effect of different diets on the metabolism of freight horses. IV. Effect of partial substitu-

tion of oats by the waste products of the sugar industry on the utilisation of nitrogen, calcium, and phosphorus. S. E. Borshkovski, M. F. Guli, V. A. Smoljar, A. K. Martinenko, V. V. Michailova, and M. K. Netschitailo (Ukrain. Biochem. J., 1937, **10**, 49—79).—The substitution of sugar-beet press residue and molasses for a portion of the oats in the diet of horses caused little alteration in the assimilation of N or P, but improved the absorption of Ca. This was partly due to the fact that the P : Ca ratio of the diet was reduced from approx. 2·8 to 1·8. W. O. K.

Composition and food value of the locust (*Schistocirca gregaria*). C. Lapp and J. Rohmer (Bull. Soc. Chim. biol., 1937, **19**, 321—324).—The locust contains more fat and protein than the majority of the usual foodstuffs. It is rich in mineral constituents and cholesterol. A. L.

Phosphatide metabolism. I. G. Davanzo (Deut. Z. Chirurg., 1936, **247**, 622—631).—In healthy individuals great variations occur in the phosphatide (I) content of the blood. The cholesterol (II) content increases in the premenstrual period but the lecithin (III) content does not appear to vary with the menstrual cycle. An increase in (I) content occurs in obstructive jaundice and a decrease when the hepatic cells are damaged. The increase in the (I) content observed after the ingestion of (III) is delayed and diminished in liver disease. Et_2O anæsthesia causes an increase of the (II) and decrease of the (I) content. Nutr. Abs. (*m*)

Purine metabolism in dogs. Metabolic effects of reticulo-endothelial-active substances. F. Chrometzka (Z. ges. exp. Med., 1936, **97**, 645—652; Chem. Zentr., 1936, i, 3360).—In dogs with sensitive purine metabolism, blocking the reticulo-endothelial system with Indian ink decreases the oxidation of uric acid (I) to allantoin (II). Neosalvarsan increases the elimination of purine bases and (I), especially when used in conjunction with Indian ink. The output of (II) is unchanged. The antiseptic Protonsil increases the output of (I) and lowers that of (II). Atebrin acts similarly. A. G. P.

Xanthine dehydrogenase. Dehydrogenation of uric acid to xanthine by surviving tissue. W. Reindel and W. Schuler (Z. physiol. Chem., 1937, **247**, 172—184).—Slices of surviving kidney (rat, guinea-pig, cat) aërobically convert xanthine (I), but, unless methylene-blue is present, not hypoxanthine (II), into uric acid (III). The anaërobic dehydrogenation of oxypurines thus occurs more readily than the aërobic; both are strongly inhibited by 0·001*M*-KCN. (II) is completely converted into (I) before dehydrogenation to (III). In systems of (II) + (III) + tissue containing (I) dehydrogenase, hydrogenation of (III) to (I) is correlated with dehydrogenation of (II) to (I). The bearing of these findings on purine metabolism is discussed. F. O. H.

Influence of aggregation on the transport of asparagine and caffeine in the tentacles of [the insectivorous plant] *Drosera capensis*. W. H. Arisz and J. Oudman (Proc. K. Akad. Wetensch. Amsterdam, 1937, **40**, 431—439).—Caffeine appears to be absorbed (from agar gel) by a diffusion process, the vacuoles serving as a path of transport. With asparagine, rapid absorption occurs only when the tentacle cells are aggregated (by salicin–KH_2PO_4), transport being principally by the cytoplasm, the quantity of which negatives the possibility of the occurrence of a normal diffusion process. F. O. H.

Effect of glycine on the production of creatine in the normal subject. C. Degan (Bull. Soc. Chim. biol., 1937, **19**, 686—693).—When glycine is administered to dogs on a carbohydrate diet, there sometimes occurs an increase in urinary creatine which represents, however, only a small proportion of the excess urinary N. Creatinine excretion is unaffected with the exception of occasional irregular changes. P. W. C.

Cystine metabolism. II. Detoxication of bromobenzene. F. L. Haley and G. S. Samuelsen (J. Biol. Chem., 1937, **119**, 383—387).—No quant. relationship appears to exist between the amount of cystine or other S compounds in the diet and the detoxication of PhBr, which is tolerated by the rat to the extent of 2% of the diet. P. G. M.

Metabolism of sulphur. V. Replaceability of *l*-cystine in the diets of rats with some partially oxidised derivatives. M. A. Bennett (Biochem. J., 1937, **31**, 962—965).—Identical growth curves were obtained with *l*-cystine (I) (Merck) and a highly purified (I) when added to a (I)-deficient diet of albino rats. *l*-Cystine disulphoxide can replace (I) in the diet but *l*-cysteinesulphinic acid gave no, and *S*-(guanylthio)cysteine dihydrochloride, which probably gives rise to *l*-cysteinesulphenic acid, a slight, increase in growth. The reactions involved are discussed. P. W. C.

Amino-acid metabolism. II. Fate of *d*- and *dl*-glutamic, *dl*-pyroglutamic, and *l*- and *dl*-aspartic acids in the normal animal. J. S. Butts, H. Blunden, and M. S. Dunn (J. Biol. Chem., 1937, **119**, 247—255; cf. A., 1936, 233).—The acids studied were maintained for varying periods in the intestine under conditions to produce continuous absorption at max. rate; the animals were then killed for determination of glycogen and unabsorbed NH_2-acid. Ketolytic activity was studied by superimposing the same treatment on a previous feeding of $PrCO_2Na$. *d*-Glutamic acid (I) is active both in glycogen formation (> the *dl*-acid) and in ketolysis. *l*-Aspartic is somewhat superior to both (I) and *dl*-aspartic acid. Pyroglutamic acid resembles (I) in its metabolism. R. M. M. O.

***d*-Glutamic acid as a salt substitute. III.** F. Mainzer (Wien. Arch. inn. Med., 1936, **29**, 315—320).—Administration of 20 g. of glutamic acid (I) has no effect on the amount or concn. of Cl excreted. The quantity of urea produced (4 g.) is small. 20 g. of (I) exceeds the daily requirement as a NaCl substitute. Nutr. Abs. (*m*)

Formation of histamine from histidine by animal tissues. E. Werle and H. Herrmann (Biochem. Z., 1937, **291**, 105—121; cf. this vol., 18).—Slices of rabbit and guinea-pig kidney convert

l-histidine (I) (but not *d*-histidine) into histamine (II), max. yield being attained in 40—60 min. at p_H 9·0 and 37·5° with (I) concn. 1·6*M*. Rabbit and guinea-pig liver and guinea-pig pancreas also convert (I) into (II). Glycerol and aq. extracts (also Tyrode's solution) of rabbit's kidney also produce (II) from (I), the yield increasing with increase in the concns. of the substrate and the decarboxylase (III). (III) is concentrated by pptn. (half saturation) with $(NH_4)_2SO_4$. The conversion of (I) into (II) is inhibited by Cu, Fe, and HCN. Probably the amount of (II) produced depends on the relative proportions of (III) and histaminase (IV) present. Organs containing sufficient (IV) may produce (II) which cannot be detected owing to the action of (IV). W. McC.

Metabolism of glyoxaline. III. The digestive or metabolic origin of glyoxaline in the urine of various animals. P. Lelu (Bull. Soc. Chim. biol., 1937, **19**, 292—302; cf. this vol., 129).—The glyoxaline (I) excretion of rats, dogs, and rabbits injected with histidine (1 g. per kg. body-wt.), and when the min. level of endogenous metabolism was reached, was slow. During the experimental period, (I) in the urine of the rabbit was ten times > that in the dog and rat. The origin of (I) is therefore probably metabolic. A. L.

Production of tyramine in warm-blooded animals. H. A. Heinsen (Z. physiol. Chem., 1937, **246**, 282).—A correction (cf. this vol., 91). F. O. H.

Biological formation of hordenine. Y. Raoul (Bull. Soc. Chim. biol., 1937, **19**, 675—685).—Tyrosine on heating at 250° under reduced pressure gives tyramine (yield 50%) which on refluxing with CH_2O + HCO_2H for 10 hr. affords hordenine (I) (yield 50%). The same mixture on keeping at room temp. after a week contains traces, and after a month a 16% yield, of (I). The possibility of CH_2O being similarly used in nature for methylating tyramine in the production of (I) is discussed. P. W. C.

Degradation of tyrosine and related substances by liver- and kidney-pulp. K. Felix, K. Zorn, and H. Dirr-Kaltenbach (Z. physiol. Chem., 1937, **247**, 141—166).—*l*-Tyrosine (I) is oxidised in presence of pig's liver-pulp in three stages (according to [H·]) with O_2 consumption of 1, 2, and 4 atoms, respectively, the final products being $CH_2Ac{\cdot}CO_2H$ (II) and CO_2. *p*-Hydroxyphenylpyruvic (III) and homogentisic acid (IV) are not intermediaries whilst NH_3 is not liberated. *dl*-(I) is oxidised completely by 4 O, (III) and NH_3 being formed in amounts equiv. to the *d*-(I). Under appropriate conditions, (III) is oxidised by 3 O to (II) and CO_2 and (IV) by 2 O to (II). With kidney-pulp, both *l*- and *dl*-(I) are oxidised (by O) but deamination only occurs with *dl*-(I), the liberated NH_3 then corresponding with the *d*-(I). With either liver- or kidney-pulp, *l*-phenylalanine (V) is oxidised (O) without formation of NH_3, keto-acid, or (I); *d*-(V) is oxidised (>1 O) with equiv. liberation of NH_3, the phenylpyruvic acid (VI) produced being oxidised to $CH_2Ph{\cdot}CO_2H$ and CO_2. Kidney extracts oxidise only *d*-(I) to NH_3 and (III) and deaminate *d*-(V) to (VI). Thus kidney-pulp contains two enzyme-systems, one dehydrogenating the naturally occurring optical isomeride of (I) and (V) without deamination (NH_2-acid dehydrogenase) and the other, readily extractable, oxidatively deaminating the non-naturally occurring isomeride (NH_2-acid deaminase). F. O. H.

Metabolism of nitrogen and the lungs. L. Binet and M. Burstein (Compt. rend. Soc. Biol., 1937, **125**, 120—121).—The hypotensive action of blood containing peptone is decreased on perfusion through the lung *in vitro*. H. G. R.

Absorbability of sterols with particular reference to ostreasterol. W. M. Sperry and W. Bergmann (J. Biol. Chem., 1937, **119**, 171—176).—On feeding mice with ostreasterol, which is constitutionally related to the non-absorbable plant sterols although of animal origin, the liver-sterol content is significantly increased above the level produced by diets containing no added sterol or only unabsorbable sterols. R. M. M. O.

Absorption of fat from the human ileum. H. Doubilet and M. Reiner (Arch. Int. Med., 1937, **59**, 857—864).—Clinical data (one case) indicate that the ileum secretes a fluid containing 2% of lipins. Bile acids increase the vol., but not the concn., of the secretion and, in small amounts, do not affect the absorption of olive oil or oleic acid. F. O. H.

Physiology of digestion. I. Effect of calcium salts on the digestion of fats. Y. Nakamura (Z. ges. exp. Med., 1936, **99**, 494—497).—Addition of H_2O-sol. Ca salts to milk causes pptn. of almost all the Ca as soaps; addition also of bile does not affect the results. In dogs, administration of Ca lactate causes increased fæcal excretion of Ca, fat, and fatty acids. Nutr. Abs. (*m*)

Absorption of olive oil. V. Ducceschi and A. Roncato (Quad. Nutrizione, 1936, **3**, 368—385).—In man absorption of crude oils refined by neutralisation of free fatty acids is as high as is that of first quality "virgin" olive oil. Nutr. Abs. (*m*)

Biological oxidation of highly unsaturated fatty acids.—See A., II, 321.

Fate of morphine in the animal organism. H. Simonnet (Compt. rend., 1937, **204**, 1371—1372).—Minced liver or brain destroys morphine (I) to the extent of 4·5—38% depending on the conditions of temp. and concn. The liver, perfused at 39° with Ringer's solution containing 0·05% of (I), does not destroy the drug, whilst the perfused head destroys 20—60%. J. L. D.

Fate of phenol injected into the circulating blood. A. D. Marenzi (Compt. rend. Soc. Biol., 1937, **125**, 547—548).—Conjugation is rapid in all the organs but is slower if the small intestine is removed. H. G. R.

Effect of infundibular puncture on the blood-sugar and hepatic glycogen in rats. M. Cahane (Compt. rend. Soc. Biol., 1937, **125**, 192—194).—Hyperglycæmia reaches a max. in 3 hr. and returns to normal in 24 hr., whilst a progressive decrease occurs in liver-glycogen. H. G. R.

Cyclic variation of liver-glycogen of the white mouse, determined by the number-of-stages

method. G. C. Hirsch and R. F. J. van Pelt (Proc. K. Akad. Wetensch. Amsterdam, 1937, **40**, 538—546).—Results obtained by Agren *et al.* (A., 1931, 980) using chemical methods have been confirmed by Hirsch's method. In March, the liver contained the max. amount of glycogen (I) between 8 p.m. and 2 a.m. and the min. between 12 and 5 p.m. Winter animals are somewhat later, and spring animals somewhat earlier, in reaching the max. of the (I) cyclic change. J. N. A.

Utilisation of carbohydrates by carnivora. R. Schoenemann (Landw. Versuchs-Stat., 1937, **128**, 1—88).—Glucose, fructose, sucrose, and maltose were less effective than starch in producing fat in dogs. Results of numerous feeding trials are discussed in relation to the bacterial activity of the intestine and the supposed stimulative action of the sugars. A. G. P.

Metabolism of carbohydrates in avitaminosis-B_1. I. I. Nitzescu, G. Benetato, and R. Oprean (Compt. rend. Soc. Biol., 1937, **125**, 188—191).—The disturbance in carbohydrate metabolism is due to a derangement in the aërobic phase of metabolism, due to a decrease in respiration. H. G. R.

Carbohydrate metabolism of small ruminants. Acid-base equilibrium and behaviour of blood-sugar. J. Brüggemann (Arch. wiss. pr. Tierheilk., 1936, **71**, 107—137).—Determinations of blood-sugar (I) and -lactic acid (II) and of the alkali reserve of the blood-plasma of 6 ewes, a ram, and a dog before and after large doses of glucose, fructose, galactose, lactic acid, Na lactate, or HCl, given orally, intravenously, intraperitoneally, and by fistulæ, show that, in sheep, (I) does not vary greatly under normal conditions. Appreciable variations occur in (II), these being usually accompanied by corresponding inverse variations in the alkali reserve. Carbohydrate metabolism and acid–base equilibrium in small ruminants are qualitatively similar to those in carnivores. Nutr. Abs. (*m*)

Rate of absorption of glucose from the gastro-intestinal tract of the cat, and the effect of insulin on the absorption coefficient. H. Chaudhuri and B. S. Kahali (Indian J. Med. Res., 1936, **23**, 963—971).—The optimum concn. of glucose for absorption is 0·55—0·75*M*. The average absorption coeff. with 0·55*M* solution injected directly into the duodenum is 0·48; it is lowered by simultaneous injection of insulin. R. N. C.

Formation of glucose-1-phosphoric acid in muscle extract. G. T. Cori and C. F. Cori (Proc. Soc. Exp. Biol. Med., 1937, **36**, 119—122).—Adenylic acid (and to a small extent inosic acid) catalyses the phosphorylation of glucose. With minced and washed muscle, the rate of formation of the 1-ester exceeds the rate of conversion into the 6-ester (which is rapid with fresh muscle extract). Addition of $Mg^{\cdot\cdot}$ catalyses the conversion of 1- into 6-ester but does not affect phosphorylation. P. G. M.

Glycolysis without phosphorylation in the chick embryo. J. Needham and H. Lehmann (Nature, 1937, **139**, 368—369).—Further details support the view that glycolysis proceeds in young tissues without phosphorylation (A., 1936, 1411). In this case glutathione is necessary, and AcCHO, $CO(CH_2{\cdot}OH)_2$, and glycerol are not intermediates. L. S. T.

Glutathione and the Pasteur reaction. Z. Baker (Biochem. J., 1937, **31**, 980—986).—Glutathione (I) has no significant effect on the aërobic glycolyses of tumour, brain, testes, and embryo, as measured in the Dixon–Keilin manometers. The results do not indicate that (I) participates in the Pasteur reaction. The sp. effect of $NHPh{\cdot}NH_2$ on the Pasteur reaction observed by Dickens in Jensen sarcoma was not found in other tumours. Increased aërobic glycolysis was normally paralleled by inhibited respiration. P. W. C.

Utilisation of ketones by the tissues in ketosis. R. H. Barnes and D. R. Drury (Proc. Soc. Exp. Biol. Med., 1937, **36**, 350—352).—Ketones are oxidised by the tissues in ketosis. H. G. R.

Ketosis. XI. Relation of fatty livers to fasting ketonuria in the rat. H. J. Deuel, jun., L. F. Hallman, and S. Murray (J. Biol. Chem., 1937, **119**, 257—268).—No appreciable ketonuria results from a period of fasting following administration of a stock diet (5·4% of fat). Fasting ketonuria, which is higher in females, follows the feeding of a high-fat diet. The liver-fat is highest following feeding of butter fat, whilst ketonuria is greatest following administration of cod-liver oil. The rate of decrease in liver-fat is slowest following a high-cholesterol diet. P. G. M.

Ketogenesis. P. P. Cohen (J. Biol. Chem., 1937, **119**, 333—346).—A sp. skeleton group, $\cdot CH_2{\cdot}CH_2{\cdot}CO\cdot$ or $\cdot CH{:}CH{\cdot}CO\cdot$ is necessary for oxidation by a β-oxidase system, and oxidation will occur β to the CO. Antiketogenesis of the higher odd-numbered fatty acids is explained on a scheme involving the hypothetical intermediates β-hydroxyacrylic and glyceric acid. P. G. M.

Ratio $Q_a : Q_e$ and the Nicloux coefficient K for acetone with *Carassius auratus*. (A) G. Fontès and A. Lindenberg. (B) M. Nicloux (Compt. rend. Soc. Biol., 1937, **125**, 456—458, 458).—(A) The mean vals. for $Q_a : Q_e$ and K are 0·695 and 1·46 respectively. (B) H_2O impermeable to EtOH is also impermeable to $COMe_2$. H. G. R.

Influence of various avitaminoses on lactic acid metabolism. F. E. Krusius and P. E. Simola (Biochem. Z., 1937, **290**, 428—443).—Lack of vitamin-*A* has no effect on the blood-lactic acid (I) content of rats or guinea-pigs and lack of -*C* in guinea-pigs causes a very slight increase of (I). Lack of the -*B* complex after a short time causes a 58% increase of blood-(I). Feeding autoclaved yeast (-*B* destroyed) causes an 88% increase of blood-(I) which is decreased to 47% when -B_1 is also administered. Feeding -B_1 without autoclaved yeast produces an increase of 200% in blood-(I). A similar increase is obtained on feeding with protein of hen's egg. In fasting animals the vals. are normal. P. W. C.

Phosphorus metabolism. VII. Course of phosphorus in alimentary tract of the rat. G. E.

YOUNGBURG (Proc. Soc. Exp. Biol. Med., 1937, **36**, 230—233; cf. A., 1936, 886).—A substantial secretion of P compounds, especially inorg. PO_4''' and phospholipins, into the intestinal lumen through the wall is indicated. W. O. K.

Phosphorus metabolism in normal and rachitic rats with a radioactive phosphorus isotope. M. J. L. DOLS, B. C. P. JANSEN, G. J. SIZOO, and J. DE VRIES (Proc. K. Akad. Wetensch. Amsterdam, 1937, **40**, 547—558).—The prep. of radioactive $^{32}_{15}P$ together with a method for its determination in the body are described. There was a very good recovery of P administered as "active" Na_2HPO_4 either by stomach tube or by injection into the tail vein. In each case a rapid entrance of P into bone was observed. Gross absorption and re-excretion of P into the intestine were similar in normal and rachitic rats, and in rachitic rats which had previously received large doses of vitamin-*D*. J. N. A.

Disturbances of calcium and phosphorus absorption. J. CAYLA (Progr. méd. Paris, 1935, No. 43).—In general, 50% of the Ca and 35% of the P ingested is not absorbed from the intestine. Even with a sufficiency of both and the diet and bile secretion normal, absorption is defective if there is insufficient phosphatase (I) production, and if the H_3PO_4 liberated is neutralised by excess of alkali or pptd. in insol. form. Even with excess of Ca, absorption may be normal if there is sufficient (I) present to cause rapid liberation of H_3PO_4 and to dissolve Ca. Vitamin-*D* appears to establish such conditions. Excess of fat, which ppts. part of the Ca, or addition of acid has a similar effect. Ca deficiency does not affect P absorption, but P deficiency reduces Ca absorption. NUTR. ABS. (*m*)

Nutritional economics of dietary calcium. F. L. GUNDERSON (Amer. J. Publ. Health, 1937, **27**, 570—574).—The Ca contents of certain foodstuffs are tabulated and the relative cost to the consumer of the amount to give 1 g. of Ca is calc. W. L. D.

Excretion of calcium by the large intestine of the rabbit. S. J. COWELL (Biochem. J., 1937, **31**, 848—855).—Under certain conditions, the concn. of Ca per g. of dried fæces increases as the latter passes along the upper part of the large intestine. Higher concns. of both Ca and P are found in the outer shells of the fæcal pellets than in the inner portions when rabbits have received a mixed diet containing plenty of Ca. Reasons are given for interpreting the results as evidence that Ca can be excreted by the upper part of the rabbit colon and the physiological significance is discussed. P. W. C.

Effect of cereals on calcium, magnesium, and phosphorus assimilation. S. RANGANATHAN (Indian J. Med. Res., 1935, **23**, 229—236).—Ca assimilation by rats is high on whole wheat, polished rice, or cholam diets, but low on cambu or ragi. The Mg balance is positive only on the whole wheat and polished rice diets. P retention is high and of the same order on all the five diets. R. N. C.

Applications of the allometry formula to the study of animal growth. P. MEUNIER (Bull. Soc. Chim. biol., 1937, **19**, 244—258; cf. A., 1936, 1034).—The fixation of Ca and K by the developing chick embryo takes a course analogous to that of total and non-protein-N. Application of the equation of allometry to the vals. for the contents of org. matter, H_2O, P, Mg, ash, and Ca during the ossification of the humerus and femur of rats serves to co-ordinate the data for these factors and to show that there is a marked change in the process of ossification when the body-wt. is 30—50 g. A. L.

Effects of a bivalent cation on sodium removal from intestinal loops. R. C. INGRAHAM and M. B. VISSCHER (Proc. Soc. Exp. Biol. Med., 1937, **36**, 201—202).—When NaCl and $MgCl_2$, each in semi-isotonic concns., are placed in an isolated loop of the intestine of a dog under amytal anæsthesia, $Na^{\cdot}$ is absorbed and the $[Na^{\cdot}]$ may fall to $\frac{1}{10}$ of that in blood-serum. W. O. K.

Retention and utilisation of small amounts of orally administered iron. W. M. FOWLER, A. P. BARER, and G. F. SPIELHAGEN (Arch. Int. Med., 1937, **59**, 1024—1028).—1—1·5 g. of Fe NH_4 citrate is sufficient to replenish depleted Fe stores and to produce a fairly rapid increase in hæmoglobin in hypochromic anæmia. H. G. R.

Metabolism of nitrogen and sulphur in dietary supplements. A. RAJZMAN (Arch. internat. Physiol., 1936, **43**, 397—422).—Total S in food and fæcal material is determined by oxidising the material in a bomb calorimeter, further oxidising with aq. Br, removing Fe and Ca, and pptg. the S as $BaSO_4$. The N : S ratio of the material stored by pigs during growth remains approx. const. despite variations in the quality of the protein fed. NUTR. ABS. (*m*)

Sulphurous acid and formaldehyde in corpses. W. SPECHT (Deut. Z. ges. gerichtl. Med., 1936, **26**, 341—350; Chem. Zentr., 1936, i, 3551—3552).—Both SO_2 and CH_2O may be present as natural degradation products. H. J. E.

Rationale of certain methods used in physical treatment. (SIR) L. HILL (Lancet, 1937, **232**, 1035—1039).—A lecture. Physiological effects and uses of Ra radiations, *X*-rays, ultra-violet and infra-red light, and high-frequency electric waves are described. L. S. T.

Rôle of electrical, photo-chemical, and diffusion processes in vision. L. S. ORNSTEIN and J. F. SCHOUTEN (Proc. K. Akad. Wetensch. Amsterdam, 1937, **40**, 376—382).—Stimulation of part of the retina by light produces a sudden fall in the sensitivity of the fovea to a const. level (lasting approx. 0·1 sec.) followed by a rapid recovery ("α-adaptation") after short (<10 sec.) exposures and by a slow recovery ("β-adaptation") after long exposures. The mechanism of these changes is discussed. F. O. H.

Radioactivity of thorium dioxide sol. R. B. TAFT (J. Amer. Med. Assoc., 1937, **108**, 1779—1781).—Measurements with a Geiger counter show that a clinical dose of ThO_2 sol (75 c.c.) is equiv. in γ-ray activity to $1·37 \times 10^{-6}$ g. of Ra. Since little is excreted this is a dangerous dose. E. M. W.

Effect of radioactive phosphorus on the blood of growing chicks. K. G. Scott and S. F. Cook (Proc. Nat. Acad. Sci., 1937, **23**, 265—272).—Oral administration of radioactive $^{32}_{15}P$ (prepared from red P by deuteron bombardment) and oxidation with HNO_3 has little effect on the lymphocytes, but markedly decreases the polymorphonuclear leucocytes of young growing chicks. Radioactive P may be of use for direct irradiation of the bone marrow, in the neighbourhood of which it is selectively deposited. W. O. K.

Effect of variations in atmospheric ozone on the biological activity of sunlight. R. Latarjet (Rév. Opt. theor. instrument., 1935, **14**, 398—414; Chem. Zentr., 1936, i, 3537).—A mathematical relation between biological activity (measured by erythrema of the skin), the proportion of O_3, its absorption coeff., and the intensity and λ of the sunlight is established. A. G. P.

Effect of incubation temperature on time of death of chick embryo, and relation of energy metabolism to mortality. E. M. Pringle and H. G. Barott (J. Agric. Res., 1937, **54**, 465—468).—The rate of change in energy metabolism and mortality in chick embryos are related. Peak mortality occurs at the third day and shortly before hatching. A. G. P.

Anabiosis and fish transport without water. P. J. Schmidt and G. P. Platonov (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 255—260).—Fish of various species after chilling in ice-cold H_2O may be preserved and transported on ice for ≥ 10 days in air and for ≤ 2 days in N_2. A large proportion revive when placed in cold H_2O at a suitable temp. W. O. K.

Utilisation of oils as perfusates. G. Ettisch and S. F. G. da Costa (Compt. rend. Soc. Biol., 1937, **125**, 560—562).—*Ascaris* can be maintained alive in oil (with the exception of castor oil) and the physiological effects of some substances can be demonstrated in oily solution. H. G. R.

Increase of body-activity by artificially induced changes in the acid-base equilibrium. H. Dennig (Chem.-Ztg., 1937, **61**, 526—527).—Production of alkalosis in man by ingestion of $NaHCO_3$, $KHCO_3$, Na citrate, or suitable diets permits a 30—100% increase in physical activity which is most marked on the 2nd day following ingestion. F. O. H.

Sodium salts and [alimentary] disequilibrium. R. Lecoq (Compt. rend. Soc. Biol., 1937, **125**, 434—436).—Polyneuritic symptoms are developed in pigeons on a normal diet containing large quantities of NaCl or Na_2SO_4. H. G. R.

Pharmacological action of tannic acid. VII. Action on diuresis produced by hypertonic sodium chloride solution. U. Sammartino (Arch. Farm. sperim., 1937, **63**, 81—113; cf. A., 1936, 1148).—Intravenous injection of *N*-NaCl into rabbits produces an excretion of H_2O >, and of NaCl <, the amount injected, respectively. The diuresis is not modified by injection of aq. tannic acid. F. O. H.

Zinc [and growth of rats]. W. R. Sutton and V. E. Nelson (Proc. Soc. Exp. Biol. Med., 1937, **36**, 211—213).—The growth and health of rats are seriously impaired by the presence in the diet of $ZnCO_3$ equiv. to 1% of Zn. When 0·5% of Zn is present, the animals grow normally, but reproduction is disturbed and blood-hæmoglobin is lowered. W. O. K.

Relative effectiveness of iodine in thyroxine, di-iodotyrosine, and potassium iodide in inducing metamorphosis in amphibia. A. Lein (Proc. Soc. Exp. Biol. Med., 1937, **36**, 348—350).—I in thyroxine is 300 times as active as that in di-iodotyrosine, which is more active than that of KI. H. G. R.

Action of di-iodotyrosine, iodine, and iodoglidin on the cholesterol content of the blood. P. Ghaliounqui and F. Zell (Arch. exp. Path. Pharm., 1937, **185**, 71—76).—Di-iodotyrosine (I) administered by stomach tube causes in rabbits a decrease of 12—42% in total cholesterol (II), the decrease consisting almost entirely of esterified (II). The effect is of the same order for doses of (I) from 12·5 to 200 mg. and is inhibited by veronal. Iodoglidin (0·48 g.) has a similar but Lugol solution had no effect. P. W. C.

Anticonvulsant properties of some phenyl derivatives. T. J. Putnam and H. H. Merritt (Science, 1937, **85**, 525—526).—A method for determining the convulsant effects of drugs is described. Of the many phenolic compounds investigated diphenylhydantoin, COPhMe, and $COPh_2$ have, towards the cat, the greatest anticonvulsant activity combined with the least relative hypnotic effect. L. S. T.

Effect of 2 : 4-dinitrophenol on oxygen consumption of the rabbit lens. J. Field, 2nd, and E. G. Tainter (Proc. Soc. Exp. Biol. Med., 1937, **36**, 277—278).—Concns. of 0·05—1·25 mg. stimulate whilst those >5 mg. per 100 c.c. inhibit O_2 consumption; the optimum concn. is 0·10—0·30 mg. per 100 c.c. P. G. M.

Active form of 2 : 4-dinitrophenol in the stimulation or inhibition of oxygen consumption of excised rabbit muscle. A. W. Martin and J. Field, 2nd (Proc. Soc. Exp. Biol. Med., 1937, **36**, 375—377).—The undissociated is the active form of 2 : 4-dinitrophenol (cf. A., 1935, 1539). H. G. R.

Relative toxicity of cresols as demonstrated by tests with *Carassius auratus*. W. A. Gersdorff (J. Agric. Res., 1937, **54**, 469—478).—Relative toxicities of *p*-, *o*-, and *m*-cresol, and PhOH were 2·0 : 1·3 : 1·0 : 1·1. Rotenone was approx. 360 times as toxic as *m*-cresol. A. G. P.

Sulphæmoglobinæmia and methæmoglobinæmia following administration of *p*-aminobenzenesulphonamide. J. P. J. Paton and J. C. Eaton (Lancet, 1937, **232**, 1159—1162).—Administration of $MgSO_4$ simultaneously with or ≥ 3 days before that of *p*-$NH_2 \cdot C_6H_4 \cdot SO_2 \cdot NH_2$ (I) generally produces sulphæmoglobinæmia. Formation of sulphæmoglobin (II) occurs rapidly even after small doses of (I). In absence of SO_4'' large doses of (I)

are well tolerated, but 12—24 g. per day often result in methæmoglobinæmia. The removal of (II) from the blood is much slower than removal of methæmoglobin, which disappears in approx. 24 hr. Spectroscopic examination of the blood is a more effective method of detecting sulphæmoglobinæmia than is clinical observation of cyanosis. O_2 is of val. in treatment of methæmoglobinæmia, but not of sulphæmoglobinæmia. L. S. T.

Hydrotropic action of Convolvulaceæ resins on lecithin. G. VALETTE (Compt. rend. Soc. Biol., 1937, **125**, 405—407).—The quantity of lecithin dissolved by the bile is increased by the addition of these resins. H. G. R.

Hæmolytic action of Convolvulaceæ resins and their hydrolysis products. G. VALETTE (Compt. rend. Soc. Biol., 1937, **125**, 407—409).—The hæmolytic action of the bile salts is increased by the resins and, to a smaller extent, by their hydrolysis products. H. G. R.

Physiological behaviour of acetyl derivatives of optical isomerides of homocystine; biological proof of their stereostructure. V. DU VIGNEAUD, H. M. DYER, and C. B. JONES (J. Biol. Chem., 1937, **119**, 47—57; cf. A., 1935, 737).—*Acetyl*-l-*homocystine*, $[\alpha]_D^{20}$ −21·3° in H_2O, was capable of supporting growth of rats on a cystine-deficient diet and was also oxidised *in vivo* by the rabbit. *Acetyl*-d-*homocystine*, $[\alpha]_D^{21}$ +21·5° in H_2O, did not support growth and was oxidised only with difficulty. The results are discussed from the viewpoint of Ac derivatives of other stereoisomeric NH_2-acids. J. N. A.

Effects of some products of digestion and accessory substances on the rhythmical contractions of the isolated mammalian intestines. R. K. PAL and S. PRASAD (Indian J. Med. Res., 1935, **23**, 515—523). R. N. C.

Substances affecting adult tissue *in vitro*. III. A stimulant (the "A" factor) in serum ultrafiltrate involved in overcoming adult tissue dormancy. H. S. SIMMS and N. P. STILLMAN (J. Gen. Physiol., 1937, **20**, 649—662; cf. A., 1936, 1021).—Fresh adult tissue implanted into a plasma medium grows faster, after a shorter induction period, when it has had a previous incubation in serum. The factor responsible for this is not identical with the known proteins or enzymes, passes an ultrafilter, and is not species-sp. It gives ppts. with $Cu^{\cdot\cdot}$ and $Ca^{\cdot\cdot}$, withstands heating at 100° for 10 min. at p_H 7, but is destroyed in longer periods (3 hr.) or at widely different p_H. The stimulating activity is possessed by urine and lymph, and, to a smaller extent, by ventricular fluid. F. A. A.

Recovery of divinyl ether from human tissues. T. J. DOMANSKI (J. Biol. Chem., 1937, **119**, 69—72).—Methods for recovering the ether from brain and from aq. solution are described. The average recovery from 500 g. of brain containing 0·16 to 0·39 c.c. is 58·2%, whilst that from aq. solution containing 0·5 to 1·0 c.c. per litre is 90·5%. J. N. A.

[Production of] rhythmic automatism in the muscle of the leech by quinine phenylethylbarbiturate and its suppression by potassium chloride. H. BUSQUET (Compt. rend. Soc. Biol., 1937, **125**, 618—620). H. G. R.

Identification of hypnotics in viscera. M. J. PAPAVASSILIOU and S. N. LIBÉRATO (J. Pharm. Chim., 1937, [viii], **25**, 586—595).—The viscera are extracted with an org. solvent and the product so obtained is micro-sublimed. Photomicrographs of sublimed trional, tetronal, sulphonal, proponal, phanodorm, dial, veronal, and luminal are given for comparison. Identity is confirmed by m.p. J. N. A.

Locoine, the poisonous principle of the loco weed, *Astragalus earlei*. G. S. FRAPS and E. C. CARLYLE (Texas Agric. Exp. Sta. Bull., 1936, No. 537, 18 pp.).—*Locoine* is isolated from EtOH extracts of the plant by pptn. with phosphotungstic acid after clearing with basic Pb acetate. It is a basic substance (8·8% N; *tartrate*, *citrate*, *oxalate*, and *chloride* described), forms an *Ac* derivative, and in some respects resembles but probably is not an alkaloid. It contains no Se. Toxicity trials with cats are recorded. A. G. P.

Variations in the effects of novocaine and morphine citrates on the nerves in an electrolyte-free medium according to differences in the concentration. J. RÉGNIER and Q. QUEVAUVILLER (Compt. rend. Soc. Biol., 1937, **125**, 627—629).—The activity of the citrates is 0·2—0·1 of that of the hydrochlorides. H. G. R.

Action of strychnine on salivary digestion. G. PARISINI (Arch. Farm. sperim., 1937, **63**, 114—116).—The amylolytic activity of saliva *in vitro* is increasingly inhibited by concns. of strychnine decreasing down to $1:5\times10^{-4}$; further dilution reduces the inhibitory effect whilst concns. of $1:5\times10^{-5}$ have a slight accelerating action. F. O. H.

Pharmacological action of tylophorine, the alkaloid occurring in *Tylophora asthmaticus*. R. N. CHOPRA, N. N. DE, and M. CHAKERBURTY (Indian J. Med. Res., 1935, **23**, 263—269). R. N. C.

Action of arasaponins *A* and *B*. K. K. CHEN and T. Q. CHOU (Proc. Soc. Exp. Biol. Med., 1937, **36**, 394—396).—The saponins of *Gynura pinnatifida* have a hæmolytic action on some animals. H. G. R.

Peristaltic activity of senna leaves and their active constituents. W. STRAUB and E. TRIENDL (Arch. exp. Path. Pharm., 1937, **185**, 1—19).—Extract of senna leaves is active when administered parenterally, intramuscularly, or intravenously, the period before action on the large intestine varying from 8 hr. to 30 min. During this period, enzymic degradation of the glucoside occurs, followed by oxidation of the anthranol to the anthraquinone, the latter being probably the active substance and the glucoside the more sol. and more absorbable form. The mechanism and type of action on the intestine are discussed. P. W. C.

Methyl chloride (refrigerator) gas poisoning. A. WEINSTEIN (J. Amer. Med. Assoc., 1937, **108**, 1603—1605).—The danger of poisoning by the refrigerant MeCl is enhanced by its non-irritating, odourless nature. E. M. W.

Effects of lactic, pyruvic, succinic, fumaric, and glycerophosphoric acids on the activity of frog muscle and heart poisoned with bromoacetic acid. K. Grimlund (Skand. Arch. Physiol., 1936, **73**, 109—122; Chem. Zentr., 1936, i, 3537).—After addition of lactic acid and $AcCO_2H$ the poisoned muscles performed more mechanical work and showed higher respiration than in the absence of the donators. Succinic, fumaric, and glycerophosphoric acids had no action on intact sartorius, probably because they cannot penetrate, but produced positive effects in, punctured muscle. A. G. P.

Cumulative action of sublimate, strychnine, and arsenious acid on cultures of iris epithelium *in vitro*. K. Saito (Folia Pharmacol. Japon., 1935, **21**, 192—206).—Growth is accelerated by dil. solutions of these drugs but ceases later owing to cumulative effects. Ch. Abs. (*p*)

Rapid detection of acute poisoning with mercury, arsenic, or lead. S. Mihaéloff (Bull. Soc. Chim. biol., 1937, **19**, 757—759).—A simplification of Reinsch's method, using strips of Cu foil, is described for determination of Hg, As, or Pb in material vomited or evacuated by cases of suspected poisoning by these metals. P. W. C.

Toxicity tests of novarsenobenzene in white mice bred in India. J. Taylor and M. L. Ahuja (Indian J. Med. Res., 1935, **23**, 91—94).—The dose recommended for the standard test is 0·3 mg. per g. wt., the animals being more susceptible than English-bred animals. R. N. C.

Fate of mercury fumes and mercurial compounds in the organism. I. Gelman and G. Derviz (J. Ind. Hyg., 1937, **19**, 215—224).—Hg fumes persist for a time in the blood in a state of at. dispersion whilst Hg salts form complexes with the blood-proteins. Clinical differentiation of the two forms of poisoning is discussed. F. O. H.

Action of thallium on the teeth. III. Effect on the chemical composition. IV. Pathological changes. S. Urabe (Acta dermatol., 1936, **27**, 87—97, 98—107).—III. Administration of Tl acetate increases the proportion of org. matter in the teeth of rats and decreases that of inorg. The Ca content is increased very slightly by small doses of Tl and decreased by larger doses. The P and Mg contents are not much affected.

IV. Large, or repeated small, doses of Tl acetate cause degenerative changes in the teeth but single small doses have no effect. Nutr. Abs. (*m*)

Glutathione in the blood of dogs during chronic poisoning with cyanides. N. Renescu and I. Potop (Compt. rend. Soc. Biol., 1937, **125**, 201—204).—The val. decreases and then fluctuates during the course of the intoxication. H. G. R.

Glycogen content of liver cells after ingestion of unusual or toxic substances. J. Sabrazès, R. de Grailly, and P. Dervillée (Compt. rend. Soc. Biol., 1937, **125**, 645—648).—Glycogen is reduced by adding EtOH and $CHCl_3$, raw mutton juice, or raw egg-yolk to the diet of rabbits. H. G. R.

Filtration studies on pyrogenic inulin. C. Tui, M. H. Schrift, K. L. McCloskey, and A. L. Yates (Proc. Soc. Exp. Biol. Med., 1937, **36**, 227—230).—The substance causing the febrile reaction in certain samples of inulin (cf. A., 1936, 1551) is removed when the aq. solution is filtered through a suitable Zsigmondy ultrafilter membrane or through two Seitz No. 3 pads. W. O. K.

Toxicant occurring naturally in certain samples of plant foodstuffs.—See B., 1937, 725.

Digestive enzymes in the southern army worm. F. H. Babers and P. A. Woke (J. Agric. Res., 1937, **54**, 547—550).—Amylase, maltase, glycogenase, invertase, rennin, lipase, trypsin, and erepsin occur in the digestive tract. The presence of raffinase is doubtful. Lactase, cellulase, emulsin, and pepsin were not detected. The distribution of the enzymes in the various sections of the tract is examined. A. G. P.

Enzymes of some wood-rotting *Polypores*. S. R. Bose and S. N. Sarkar (Proc. Roy. Soc., 1937, **B**, **123**, 193—213).—A large no. of carbohydrases, together with small quantities of lipolytic and proteolytic enzymes, were found. The concn. of extracellular was > that of intracellular enzymes and the activity was greatest in the vegetative stage. H. G. R.

Placental enzymes. Succino-dehydrogenase and glycerophosphate-dehydrogenase. D. P. da Cunha (Compt. rend. Soc. Biol., 1937, **125**, 549—551).—These enzymes are present in the placenta but to a smaller extent than in ox muscle. H. G. R.

Influence of heavy metals on enzyme reactions in milk. W. Ritter (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, **11**, 297—306).—The actions of the Schardinger enzyme and xanthine dehydrogenase are retarded by small amounts of Cu gaining entry into milk at low pasteurisation temp. Small amounts of Cu give a positive reaction for peroxidase in milk in which the native peroxidase has been destroyed by high-temp. treatment. Small amounts of α-$C_{10}H_7$·OH, p-NH_2·C_6H_4·NMe_2, and H_2O_2 counteract the oxidising catalytic effect of Cu in milk, cream, and butter. Cu is the only metal causing oxidised flavour. The heating of milk to pasteurisation temp. lowers the susceptibility to oxidised flavour, which is not due to enzyme destruction but to the formation of antioxygens. Fishiness in butter is similarly suppressed. W. L. D.

Oxidation of tyramine in the liver. F. J. Philpot (Biochem. J., 1937, **31**, 856—861).—Xanthine oxidase is not concerned at any stage in the oxidation of tyramine (I). (I) oxidase is an aërobic oxidase which is strongly inhibited by methylene-blue, the redox potential of the system lying between −0·046 and +0·195 volt. Using liver slices, 1 atom of O was absorbed per mol. of (I) and complete deamination occurred, suggesting the conversion into p-OH·C_6H_4·CH_2·CHO. P. W. C.

Dehydrogenases of *B. coli*. IV. Lactic dehydrogenase. J. Yudkin (Biochem. J., 1937, **31**, 865—868; cf. A., 1934, 221, 1264).—Dilution of

suspensions of *B. coli* causes a considerable decline in activity of lactic acid dehydrogenase (I) due to the presence of a heat-stable co-enzyme which is replaceable by yeast cozymase. Similar results were obtained with cell-free preps. of (I). The affinities for lactate of (I) of intact cells and the sol. prep. show slight but const. differences. P. W. C.

Effect of ascorbic acid on the oxidases of succinic acid and *p*-phenylenediamine. A. I. Jakovtschuk (Bull. Biol. Méd. exp. U.R.S.S., 1936, **2**, 198—199).—The O_2 uptake of washed muscle or of liver in a substrate containing succinic acid or p-$C_6H_4(NH_2)_2$ is not increased by the presence of ascorbic acid (I). (I) does not increase the O_2 uptake of washed muscle in the absence of oxidases. Nutr. Abs. (*m*)

β-Hydroxybutyric dehydrogenase of animal tissues. D. E. Green, J. G. Dewan, and L. F. Leloir (Biochem. J., 1937, **31**, 934—949).—The prep. and properties of β-hydroxybutyric dehydrogenase (I) of heart muscle are described. Co-enzyme I (II) (diphosphopyridine nucleotide) is an indispensable component of the system. Evidence is presented for the existence of a co-enzyme oxidase which catalyses oxidation of reduced (II) by O_2. (I) specifically catalyses the oxidation of *l*-β-hydroxybutyrate to acetoacetate, the product being isolated as $COMe_2$ dinitrophenylhydrazone. The reversibility of this change is demonstrated potentiometrically. The E_0' at p_H 7 is −0·282 volt. The free energy change was calc. to be 6920 g.-cal. (I) is similar in general properties to lactic and malic dehydrogenase. P. W. C.

Respiration of ocular tissues. D. Michail and P. Vancea (Compt. rend. Soc. Biol., 1937, **125**, 185—188).—The corneal, crystallin, and lachrymal oxidases are stimulated by insulin, adrenaline, ascorbic acid, and *X*-rays. H. G. R.

Action of cyanide and pyrophosphate on dehydrogenases. L. F. Leloir and M. Dixon (Enzymologia, 1937, **2**, 81—88).—No dehydrogenase except xanthine dehydrogenase is inactivated after incubation with CN′. P_2O_7'''' strongly inhibits succinic dehydrogenase (I) but no others tested. Inhibition of respiration by P_2O_7'''' is probably due to the inhibition of (I) alone. (I) probably plays an important part in the respiration of animal tissues. Dehydrogenase preps. from yeast contain an enzyme which destroys cozymase within 10 min. E. A. H. R.

Dissociation constants and reactivity of acetaldehyde reductase. E. Negelein and H. J. Wulff (Biochem. Z., 1937, **290**, 445—446).—The union of protein with diphosphopyridine nucleotide in this reductase and the reactivity of the enzyme are measured. P. W. C.

Action of alcohols on catalase. N. T. Deleano and L. Ullmann (Bull. Soc. Chim. biol., 1937, **19**, 130—136).—The actions on plant catalase give an order of descending toxicity of MeOH, amyl alcohol, EtOH, $Pr^{\beta}OH$, and $Bu^{\gamma}OH$. F. O. H.

Catalase activation in living cells. IV. K. Yamafuji (Enzymologia, 1937, **2**, 99—104; cf. A., 1936, 1296).—An emulsion obtained from young yeast cultures contains a thermostable activator of yeast catalase (I). The same activator occurs in dried baker's yeast and in silkworm eggs. (I) activity of silkworm eggs is also increased by a preliminary treatment with a boiled extract either of yeast or of silkworm eggs. E. A. H. R.

Catalase in the F_1 generation. K. Yamafuji and S. Goto (Enzymologia, 1937, **2**, 105—106).—Blood-catalase of *Bombyx mori* in the F_1 generation approximates to the mean val. of the two parents. E. A. H. R.

Influence of the nature of the organic solvent on the activity of esterase. E. A. Sym (Enzymologia, 1937, **2**, 107—109).—The rate of production of Bu and cetyl butyrates in the presence of dry pancreatic esterase is greater in non-polar than in polar solvents, and falls with increasing vals. of the dipole moment. Similar results could not be established for the esterification of glycerol by $PrCO_2H$ and oleic acid (I) or of cetyl alcohol by (I). E. A. H. R.

Choline-esterase in lizard's muscle. A. Marnay and D. Nachmansohn (Compt. rend. Soc. Biol., 1937, **125**, 489—490).—The muscle of *Lacerta viridis* contained approx. twice as much choline-esterase as mammalian muscle (guinea-pig or cat). H. G. R.

Effects of saponin and digitonin on lipase and phosphatase action. B. S. Gould (Proc. Soc. Exp. Biol. Med., 1937, **36**, 290—292).—Saponin markedly inhibits pancreatic lipase and except in high concn. has little effect on blood-lipase. It has no appreciable influence on phosphatase preps. even in a concn. of 150 mg. per 100 c.c. P. G. M.

Increase in the esterase content of the blood after oral administration of ascorbic acid. J. Mosters (Klin. Woch., 1936, **15**, 1557—1560).—The blood-esterase activity but not the lipase activity of human patients is increased by oral administration of ascorbic acid. Nutr. Abs. (*m*)

Enzymic activity and surface tension. Action of some surface-active substances on pancreatic lipase. E. Tria (Atti R. Accad. Lincei, 1937, [vi], **23**, 372—380).—The activity of pancreatic lipase on tributyrin in presence of varying amounts of Na oleate, Na salts of bile acids, or *iso*amyl alcohol reaches a max. when σ of the system is 38—40 dynes. E. W. W.

Racemiase, an enzyme which catalyses racemisation of lactic acid. H. Katagiri and K. Kitahara (Biochem. J., 1937, **31**, 909—914).—*Staphylococcus ureæ* was the only micro-organism of 30 species tested which produced racemiase. *Leuconostoc* (*l*-former) and *Lactobacillus plantarum* (*dl*-former) always produced sp. forms of lactic acid but remarkable modification of the acid isomeride formed was obtained with *Lactobacillus saké* (*d*-, *dl*- and *dl*- + *d*-former) by variation of the cultural conditions. This modification is probably due to racemiase in the bacterial cells. P. W. C.

Effect of heavy water on the hydrolysis of urea by urease. W. Brandt (Biochem. Z., 1937, **291**, 99—104).—At 25° NH_2·CO_2NH_4 is completely hydrolysed in H_2O or D_2O in 1 hr. whether or not urease

(I) is present. The conversion of NH_4CNO into urea proceeds equally rapidly in H_2O and D_2O whether or not (I) is present but the hydrolysis of urea by (I) proceeds much more rapidly in H_2O than in D_2O possibly because D_2O inhibits the interaction of substrate and enzyme or because decomp. of the enzyme–substrate compound is catalysed by $D^{\cdot} <$ by $H^{\cdot}$. W. McC.

Urease. VII. Effect on urease of certain elements of the 2nd, 4th, 5th, and 7th groups of the periodic system. A. A. Ruchelman (Ukrain. Biochem. J., 1937, **10**, 5—22).—HgO, MnO_2, Zn, and ZnO have no action on urease (I). Sb very slightly activates or inactivates (I) according to the experimental conditions, whilst Pb has an activating effect over a considerable range of [Pb]. The mechanism of the (I) action is discussed on the assumption that (I) is an ampholyte with a free CO_2H and NH_2 group. W. O. K.

Spectrographic experiments in the urease-urea system. K. G. Stern and K. Salomon (Enzymologia, 1937, **2**, 96—98).—The absorption spectrum of cryst. urease (I) between 2480 and 4000 A. remains unchanged on the addition of an amount of urea sufficient to saturate (I). Tyrosine residues in (I) probably do not participate in the formation of an enzyme–substrate complex. E. A. H. R.

Problematical existence of "ammoniacases." K. P. Jacobsohn and M. Soares (Compt. rend. Soc. Biol., 1937, **125**, 554—556).—No elimination of NH_3 was observed from phenylalanine, tyrosine, dihydroxyphenylalanine, or histidine with *B. coli* enzymes. H. G. R.

Arginase. E. J. Raschba (Ukrain. Biochem. J., 1937, **10**, 143—168).—A review. W. O. K.

Carboxypeptidase. I. Preparation of crystalline carboxypeptidase. M. L. Anson (J. Gen. Physiol., 1937, **20**, 663—669).—Extended details of the method already reported (A., 1935, 897) are given. F. A. A.

Protease secretion of gelatin-liquefying bacteria. G. Gorbach and E. Pirch (Enzymologia, 1937, **2**, 92—95).—The protease (I) found in culture media of gelatin-liquefying bacteria is a product of the autolysis of dead bacteria. Casein is not a suitable substrate for the (I) of *B. fluorescens liquefaciens*. E. A. H. R.

Proteolytic enzymes. XV. Intracellular proteolytic enzymes. M. Bergmann, J. S. Fruton, and H. Fraenkel-Conrat (J. Biol. Chem., 1937, **119**, 35—46; cf. this vol., 269).—If papain-I be removed from a gelatin–papain system by $NHPh{\cdot}NH_2$ (I), papain-II is automatically activated. Subsequent addition of PhCHO regenerates -I, but an inactive enzyme solution is formed, the two partial enzymes almost completely inactivating each other. Activation of papain is considered to be a dissociation of the proteolytically inactive holopapain (compound of -I with -II) into active -I and -II. -II which has been activated by (I) is not further activated by HCN. Addition of ·SH compounds to -I inactivated by (I) regenerates active -I. In absence of activators, papain attacks gelatin and its first degradation products only. Liver-cathepsin consists of cathepsin-I and -II which are quite comparable with papain-I and -II in their behaviour towards (I). Bromelin is also a dual enzyme, the relationship between the two components being essentially similar to that with papain or cathepsin. The three I-enzymes show great sp. differences. J. N. A.

Enzymic production of hydrogen sulphide from organic sulphur derivatives. C. Fromageot and R. Moubacher (Enzymologia, 1937, **2**, 121—128).—*B. coli communis* in the resting state, or an enzyme prep. obtained by treating the bacteria successively with $COMe_2$ and Et_2O, causes the decomp. of cystine (I) and cysteine (II) with liberation of H_2S (or possibly of mercaptans). The decomp. occurs only in the presence of glucose (III), HCO_2Na, or NaOAc. PhMe completely inhibits the formation of H_2S without affecting the decomp. of (III). In the decomp. of (II) there is no accompanying decarboxylation or deamination. There is no optical specificity in the action on (I). Glutathione and thiolpropionic acid undergo a similar decomp. but the presence of (III) is not essential. Methionine and taurine are unaffected. Similar decomps. are not effected by yeast preps. The name desulphurase is suggested for the enzyme. E. A. H. R.

Degradation of starch by amylase. A. Tychowski (Biochem. Z., 1937, **291**, 138—158).—β-Amylase (I) rapidly hydrolyses starch (potato, wheat, rye, barley, maize, rice) until the yield of maltose (II) is approx. 60%, the effect being independent of temp. and of the concns. of (I) and (II). Subsequently the hydrolysis proceeds very slowly. Hydrolysis with α-amylase (III) + (I) proceeds rapidly until the yield of (II) is approx. 68% and then more slowly until the yield is 70—75%, the rate increasing with increasing temp. and with increasing concn. of (I) + (III), but being independent of the (II) concn. (II) is the only sugar produced. When hydrolysis with (I) is complete the material not converted into (II) consists of non-reducing dextrins (IV) not attacked by (I). (IV) are partly converted into (II) by (I) + (III) and partly into reducing (IV). The constituent of starch easily and completely hydrolysed by (I) should be termed amylose, the other constituent being termed amylopectin. W. McC.

Biochemistry of varieties of Bengal rice. III. Enzymic digestibility of rice starch and protein: action of salivary and pancreatic amylase, pepsin, and trypsin. K. P. Basu and S. Mukherjee (Indian J. Med. Res., 1936, **23**, 777—787).—Starch (I) from Aman varieties of rice is digested more readily by salivary amylase than (I) from Aus varieties, but less readily by pancreatic amylase. Proteins (II) from Aman varieties are digested more readily by pepsin (III) and trypsin (IV) than (II) from Aus varieties; (III) is more active than (IV) with both varieties. The individual varieties of each group show variations. Parboiling increases the digestibility of (I) and (II) in both varieties. Polishing increases the digestibility of (I), but has very little effect on (II). Non-polished coloured varieties are scarcely affected by (IV), but hydrolysed readily by (III). R. N. C.

Enzymic digestibility of pulses: action of salivary and pancreatic amylase and of the proteolytic enzymes pepsin and trypsin. K. P. Basu and S. Mukherjee (Indian J. Med. Res., 1936, **23**, 827—830).—The pulse proteins are hydrolysed more readily by trypsin (I) than by pepsin (II). Lentil protein is most readily hydrolysed by either enzyme; gram protein is the most resistant to (II), and green-gram to (I). NH_2-acid production from rice protein by either enzyme after 3 hr. is of the same order as from pulse protein, although the amount of protein in rice is < in pulses. The rate of digestibility of soya-bean protein is of the same order as of pulse protein. Lentil starch is most readily digested by salivary amylase. The starches of the cereals examined are digested with equal readiness by pancreatic amylase, except gram and green-gram starch, which are more resistant.
R. N. C.

Diastatic activity of orange leaves as affected by time, temperature, p_H, and certain zinc salts. W. B. Sinclair and E. T. Bartholomew (J. Agric. Res., 1937, **54**, 609—619).—The diastatic activity is not affected by p_H within the range 4·0—5·4. Max. activity occurs at 60—65°, young leaves being relatively more active than the old. Starch in leaves is probably bound to the chloroplast and is not readily acted on by leaf-diastase (I). Added taka-diastase (II) hydrolyses leaf-starch in macerated tissue. Starch solutions are hydrolysed by (I). Addition of 30 milliequivs. of Zn (as $ZnCl_2$, $ZnSO_4$) per litre of substrate permitted quant. conversion of leaf-starch into glucose by (II), and did not inhibit the action of (I). A. G. P.

Influence of colloids and electrolytes on the equilibrium under the action of maltase. D. Michlin and P. Kolesnikov (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 199—201).—The synthesis of maltose by maltase is increased by 20—30% on adding small amounts of protein. SO_4'' also increases the extent of, and NH_4CNS completely inhibits, synthesis, these salts probably acting through their effect on the protein. P. W. C.

Emulsin. XXIX. Simultaneous fission of several substrates. β-*d*-Galactosidase of emulsin from sweet almonds. B. Helferich and W. Göller (Z. physiol. Chem., 1937, **247**, 220—224; cf. A., 1937, II, 178).—Hydrolysis of *n*-butyl-β-*d*-glucoside by sweet-almond emulsin is not diminished by the simultaneous hydrolysis of admixed phenyl-β-*d*-glucoside or *m*-tolyl-β-*d*-galactoside; the latter hydrolyses are, however, retarded. The presence of distinct enzymes for the hydrolysis of β-*d*-glucosides and -galactosides in the emulsin prep. is unlikely.
F. O. H.

Existence of different invertases. L. Ambard and S. Trautmann (Compt. rend. Soc. Biol., 1937, **125**, 133—135).—Variations have been observed in the rate at which sucrose is inverted by invertase from different sources. H. G. R.

Determination of the constitution of cozymase; isolation of adenosinediphosphoric acid as product of fission. R. Vestin, F. Schlenk, and H. von Euler (Ber., 1937, **70**, [*B*], 1369—1374).—Alkaline hydrolysis of cozymase gives a product which is chemically and biologically identical with adenosinediphosphoric acid. The presence of the pyrophosphate linking in the cozymase mol. is thus established. H. W.

Rôle of cozymase in lactic acid formation in muscle extract. O. Meyerhof and P. Ohlmeyer (Biochem. Z., 1937, **290**, 334—353).—Details of previously published work are given (this vol., 69).
P. W. C.

Cozymase and cophosphorylase. I. Coenzyme of phosphorylation. II. Differentiation of codehydrase and cophosphorylase. H. von Euler, E. Adler, G. Günther, H. Heiwinkel, and R. Vestin (Arkiv Kemi, Min., Geol., 1937, **12**, B, No. 24, 6 pp.; No. 25, 7 pp.).—I. The impurity associated with cozymase (I) responsible for its powers as a PO_4''' carrier, and also produced by alkali-inactivation of pure (I), is probably different from adenylic acid (II). The name cophosphorylase is proposed.
II. Alkali-inactivated (I), but not pure (I), can replace (II) in systems in which (II) functions as a PO_4''' carrier. E. A. H. R.

Cozymase and dihydrocozymase in extracts of animal tissues. J. Šula (Arkiv Kemi, Min., Geol., 1937, **12**, B, No. 28, 5 pp.).—The cozymase (I) and dihydrocozymase (II) contents of tissues were determined by taking advantage of the relative stabilities of (I) and (II) in acid and alkaline solutions. In extracts of muscle, liver, kidney, erythrocytes, and heart, (II) is always present in addition to (I). E. A. H. R.

Enzymic synthesis of cocarboxylase from vitamin-B_1 and phosphate. H. von Euler and R. Vestin (Naturwiss., 1937, **25**, 416).—Cocarboxylase is formed if a dried yeast prep. is incubated with a mixture of inorg. P, Na adenosinetriphosphate (or hexose diphosphate), and aneurin hydrochloride. The synthesis is incomplete. Rat liver can replace the yeast. E. A. H. R.

Animal phosphatases. VII. Activation of phosphatases by magnesium. E. Bamann and W. Salzer (Ber., 1937, **70**, [*B*], 1263—1270; cf. A., 1936, 1298).—Reasons are advanced for considering the action of $Mg^{··}$ towards animal phosphatases to be a true activation. The processes which occur are complex and the experimental data do not at present justify the assumption of changes in affinity of substrate to enzyme by $Mg^{··}$. The optimal $Mg^{··}$ concn. depends mainly on the condition of the enzyme. Experiments with α- and β-glycerophosphoric acid show that the ratio, α-: β-rate of hydrolysis, by an enzyme of the same origin is subject to greater or less fluctuation according to the condition of the enzyme and the accidental $Mg^{··}$ content of the solutions. $Ca^{··}$ alone in absence of $Mg^{··}$ is without appreciable effect on the activity of "alkaline" phosphoesterase; in the same concn. it causes considerable restriction in solutions activated by $Mg^{··}$.
H. W.

Phosphatases of liver. Phosphomonoesterases and phosphodiesterase. J. Roche and M.

Latreille (Compt. rend. Soc. Biol., 1937, **125**, 470—472).—A method for prep. of phosphomonoesterase free from phosphodiesterase is described. H. G. R.

Specificity of the phosphatases. Phosphomonoesterase A_1. J. Roche and M. Latreille (Compt. rend. Soc. Biol., 1937, **125**, 472—474).—Phosphomonoesterase A_1 is a mixture of enzymes sp. for α- and β-glycerophosphoric acids and monophenylphosphoric acid. H. G. R.

Effect of physiologically important materials on kidney-phosphatase. J. J. Pyle, J. H. Fisher, and R. H. Clark (J. Biol. Chem., 1937, **119**, 283—288).—Vitamin-*C*, $PrCO_2H$, and cystine produced inhibition, and creatine and creatinine activation, of the enzyme. Vitamin-*A* and -*D*, insulin, tyrosine, and many other NH_2-acids etc. have no effect. P. G. M.

Specific phosphatase of nervous tissue. J. Reis (Enzymologia, 1937, **2**, 110—116).—Nervous tissue contains, in addition to the normal phosphatase (I), another phosphatase, termed 5-nucleotidase (II), which has a sp. action on adenylic and inosic acids. (II) has optimal activity at p_H 7·0—7·5. The effect of Mg on (II) is $\ll$ on (I). (II) occurs in the white and grey substances of the brain and the spinal cord, in peripheral nerve, and (richest) in the retina. The sp. nature of (II) is not connected with the primary or *sec.* character of the alcohol group to which the H_3PO_4 is attached. α- and β-Glycerophosphates can be distinguished by the ability of the former to form a sol. blue-violet complex with $Cu^{\cdot\cdot}$ in alkaline solutions. E. A. H. R.

Comparative hydrolysis of α- and β-glycerophosphoric acids by vegetable phosphatases. III. Action of arsenates and fluorides on taka-diastase. IV. Effect of enzyme concentration on the affinity for substrate. J. Courtois (Bull. Soc. Chim. biol., 1937, **19**, 303—316, 317—320; cf. A., 1936, 111).—III. The inhibition of the hydrolysis of α- (I) and β-glycerophosphate (II) at p_H 4·5 by Na_2HAsO_4 and NaF $\propto$ the concn. of the inhibitor and varies inversely with the substrate concn. (II) is always hydrolysed more rapidly than (I), and the inhibitors have little effect on the fixation of the substrates by the enzyme.

IV. The affinity of the phosphatases in taka-diastase and in the seeds of white mustard and sweet almonds towards (I) and (II) is independent of the enzyme concn. A. L.

Free protein component of the yellow enzyme and its coupling with lactoflavinphosphoric acid. H. Theorell (Biochem. Z., 1937, **290**, 293—303).—The protein component (I) of the yellow respiratory enzyme (II) is pptd. by 50—100%-saturation with $(NH_4)_2SO_4$ and the isoelectric point is p_H 5·78. In (I), lactoflavinphosphoric acid (III) is probably coupled with (I) through one OH of the H_3PO_4 radical of (III) (the second OH remaining free) to a basic group of (I) and also through the NH of (III) to an acidic group of (I). The union of (III) and (I) is a reversible process as is also the ready inactivation of (I) by conversion into metaprotein. The irreversible inactivation of (I) by heat is investigated. P. W. C.

The yellow enzyme. F. Weygand (Chem.-Ztg., 1937, **61**, 545—548).—A review. E. A. H. R.

Preparation of yellow enzyme from yeast by an adsorption process. F. Weygand and H. Stocker (Z. physiol. Chem., 1937, **247**, 167—171).—The enzyme is adsorbed from yeast preps. at p_H 7 by $Al(OH)_3$ or $Fe(OH)_3$ and eluted by 2% aq. Na_2HPO_4 or $(NH_4)_2HPO_4$, the eluate being then treated with saturated aq. $(NH_4)_2SO_4$ (2 vols.). The ppt. is dissolved and, after dialysis, the solution is re-treated by the adsorption process. F. O. H.

Decomposition of yeast-nucleic acid by a heat-resistant enzyme. R. J. Dubos (Science, 1937, **85**, 549—550).—Preps. which exhibit high enzymic activity on yeast-nucleic acid (I) have been obtained. The enzyme has been prepared from polymorphonuclear leucocytes and especially from the liver, pancreas, spleen, and lungs of different animal species. It is very resistant to heat, with max. stability at p_H 4—5. The rate of action on (I) increases with temp. up to 75°, and then decreases rapidly to zero at 85°. The inhibiting effect of the higher temp. is reversible. The enzyme appears to be a protein, and is rapidly decomposed by pepsin, but is resistant to trypsin and chymotrypsin. It does not behave as a phosphatase, and has no action on thymus-nucleic acid. After the action of this polynucleotidase, (I) is sol. in mineral acids and in glacial AcOH. Several samples of cryst. trypsin and chymotrypsin contained small amounts of a heat-resistant substance which attacks (I) and heat-killed pneumococci. L. S. T.

Production of sterol by yeast. F. Reindel, K. Niederländer, and R. Pfundt (Biochem. Z., 1937, **291**, 1—6).—During the production of yeast by the method of Braun and Pfundt (B., 1937, 76) the amount of sterol present increases five-fold when the N source is inorg. and six-fold when it is org. W. McC.

Fat and lipin metabolism of yeast. V. F. Bilger, W. Halden, E. Mayer-Pitsch, and M. Pestemer (Monatsh., 1937, **70**, 259—272).—The ergosterol (I) content of certain types of yeast can be determined by means of ultra-violet absorption analysis. Protracted resting of yeast increases the content of (I) and of total sterols (II) 2- or 3-fold. In beer yeast enriched in lipins the proportion of (I) in (II) is always $<$ in the untreated material. The max. vals. of (I) are obtained from nutrient containing bottom yeast by use of maltose. The relative enrichment in (II) is considerably less with distillery than with brewer's yeast under the conditions employed. In the course of lipin enrichment a steady increase in (I) content is observed which is less marked than that of the other sterols; $CH_2I{\cdot}CO_2H$ restricts the biological synthesis of (II) and consequently of (I). H. W.

Trehalose and yeast. II. Trehalose action of yeast preparations. K. Myrbäck and B. Örtenblad (Biochem. Z., 1937, **291**, 61—69; cf. this vol., 70).—Pressed yeast does not ferment the 10% of trehalose (I) which it contains but ferments added (I). After drying, the yeast ferments its own and added (I). When a suitable poison is present pressed yeast hydrolyses (I) without fermentation. Probably, in

the cell, (I) is separated from trehalase (II) which exhibits optimal action at p_H 5—6. (II) of top yeast exists in insol. form in the cell and is more stable than maltase. (II) of bottom yeast is less stable than (II) of top yeast and (II) of Lebedev's yeast-juice is very unstable. The action of (II) is inhibited by NaF. Probably (I) is not directly fermented but converted first into glucose. W. McC.

Rôle of phosphates in oxidative processes. VII. Activation of growth of yeast by phosphates. A. Malkov and A. Mesonshik (Ukrain. Chem. J., 1937, **12**, 153—168).—The rate of multiplication of yeast cells is greatly increased by treatment with aq. phosphate (5·4% P_2O_5) for 90 min. at p_H 8·15, before placing in the nutrient medium. The effect is ascribed to formation of non-ionised complexes with intra- and extra-cellular Fe, leading to lowering of oxidative processes during the early stages of growth. The complexes gradually break down, liberating highly active Fe, as a result of which the metabolic activity of the cells is maintained at a high level over a long time. R. T.

Mechanism of the lethal effect of high pressures on cells. Intensity and duration of lethal pressures with yeast. B. Luyet (Compt. rend., 1937, **204**, 1214—1215).—Curves are given for the time–mortality effect of high pressures on *S. cerevisiæ* (*e.g.*, for 100% mortality, approx. 10 and 2 min. are required for pressures of 5000 and 6500 atm., respectively). The last 10% of the cells are most resistant. F. O. H.

Cellular death at high pressures. Similarity between the action of heat and pressure on yeast. B. Luyet (Compt. rend. Soc. Biol., 1937, **125**, 403—405).—The effects of heat and high pressure are similar and additive. H. G. R.

Effect of ultra-violet rays on the alcoholic fermentation of *Saccharomyces cerevisiæ*. I. II. V. Gronchi (Boll. soc. ital. Biol. sperim., 1933, **2**, 957—960, 961—963; Chem. Zentr., 1936, i, 3351).—I. The activity of yeast is stimulated by the long rays of the Wood lamp. Repeated exposures give best results.

II. The action on yeast is influenced by the λ of the rays and the period of exposure. Short λλ retard fermentation. A. G. P.

Open system respirometer for study of gaseous metabolism of micro-organisms. S. E. Donovick and T. D. Beckwith (J. Bact., 1937, **33**, 291—306).—Apparatus is described. The O_2 consumption of *Saccharomyces cerevisiæ* at 24 hr. was $0·18 \times 10^{-12}$ and at 36 hr. $0·28 \times 10^{-12}$ mol. per cell per hr. CO_2 production (gaseous) gave less uniform results. The causes of this are discussed. A. G. P.

Reaction of the medium and activity of ordinary and *Aspergillus* pre-treated cultures. V. Bolcato (Ind. sacc. ital., 1935, **28**, 454—459; Chem. Zentr., 1936, i, 3590—3591).—Gluconic acid is formed at p_H >3·4 and citric acid at p_H <3·4; these limits may be changed by use of an acid nutrient medium. H. N. R.

Action of potassium on metabolism. O. Kauffmann-Cosla and R. Brull (Bull. Soc. Chim. biol., 1937, **19**, 137—143).—K^+ influences the growth of *Aspergillus niger* in Raulin's solution by selective catalytic action on the synthesis of cellulose and inhibitory action (antagonising the action of Fe) on the synthesis of lipins from carbohydrates. N metabolism is not affected. F. O. H.

Utilisation of amino-acids, polypeptides, and diketopiperazines in the growth of fungi. Y. Tazawa and S. Yamagata (Acta phytochim., 1937, **9**, 299—310).—The influence of NH_2-acids, polypeptides, and diketopiperazines on the growth of *Aspergillus niger* and *A. oryzæ* at p_H 3·4 and 7·0 has been investigated. H. W.

Propagation of moulds. A. von Szilvinyi (Biochem. Z., 1937, **291**, 7—20; cf. Kluyver and Hoogerheide, A., 1934, 1138).—There is no relation between the final oxidation–reduction potential attained in suspensions of the fungi and their power to propagate but the time required for the production of each generation decreases as the respiration increases. In suspensions of living yeast the potential depends on $[O_2]$ if this is <66·7% but not if it is >66·7%. W. McC.

Mechanism of the formation of organic acids by mould fungi. II. Action of *Aspergillus niger* on glucose in the presence of sodium iodoacetate. E. M. Johnson, E. C. Knight, and T. K. Walker (Biochem. J., 1937, **31**, 903—908).—0·0013—0·001*M*-$CH_2I·CO_2Na$ (I) introduced into glucose (II) solutions in contact with the fully developed mycelium of *A. niger* caused an increased (II) utilisation and acid production. 0·002*M*-(I) was just sufficient to prevent spore formation of 6 strains of *A. niger*, was sufficient to suppress EtOH formation by 5 strains in a N_2 atm., but still permitted citric acid (III) formation to the same extent as in the absence of (I). With 0·002*M*-(I), (II) utilisation is, however, decreased and the % yield of (III) is greater in the presence than in the absence of (I). With 0·0021*M*-(I), (II) utilisation is decreased but the yield of (III) in respect to (II) utilised remains the same. 0·0025*M*-(I) does not entirely suppress formation of (III). The mechanism of formation of (III) is discussed (cf. A., 1932, 651). P. W. C.

Production of gallic acid from tannin, especially from theotannin, by *Aspergillus niger*. W. B. Deys and M. J. Dijkman (Proc. K. Akad. Wetensch. Amsterdam, 1937, **40**, 518—523).—Gallic acid (I) is produced when *A. niger* is grown on a decoction of fresh tea leaves or on a solution containing theotannin (II), sucrose, and inorg. salts. Addition of the enzyme of *A. niger* to aq. solutions of (II) caused liberation of (I). J. N. A.

Chitin in micro-organisms. (A) A. Rippel. (B) R. S. Hilpert (Biochem. Z., 1937, **290**, 444; **291**, 216—218).—(A) The view expressed by Hilpert (this vol., 143, 160) that chitin is probably not formed by certain fungi is refuted.

(B) A reply. P. W. C.

Biochemical properties and experimental pathology of a pulmonary actinomyces (*Actino-*

***myces nitrogenes*, nov. sp.).** A. Sartory, R. Sartory, J. Meyer, and A. Walter (Ann. Inst. Pasteur., 1937, **58**, 684—708).—The organism, isolated from a human lung, is a facultative anaërobe, grows on media of p_H 5·6—7·3, selectively attacks various sugars, has no proteolytic activity, and reduces NO_3' to NO_2' and N_2. W. O. K.

Metabolism of soil fungi.—See B., 1937, 715.

Isolation of a toxic substance from the culture filtrate of *Trichoderma*. R. Weindling and O. H. Emerson (Phytopath., 1936, **26**, 1068—1070).—The toxic substance $C_{14}H_{16}O_4N_2S_2$ is strongly lævorotatory, is non-basic, reduces alkaline $KMnO_4$, and yields H_2S with KOH. A. G. P.

Carbon metabolism of *Gibberella saubinetii* on glucose. L. E. Hessler and R. A. Gortner (J. Biol. Chem., 1937, **119**, 193—200).—The principal products on media containing only glucose and inorg. matter are CO_2 and EtOH; tartaric and citric acids and AcOH, but no other volatile acid, could be demonstrated along with traces of a volatile aldehyde. A balance sheet of C metabolism is presented; C in the mycelium is about $\frac{1}{4}$ of that in evolved CO_2, the proportion decreasing over several weeks' growth. R. M. M. O.

Physiology of *Rhizobium* species. D. G. Clark (Cornell Univ. Agric. Exp. Sta. Mem., 1936, No. 196, 30 pp.).—The substance responsible for growth acceleration of *R. trifolii* occurs in brown sugar, "Ca saccharate," and peptone, but not in maize starch. It is destroyed by ashing and by wet combustion, is a non-electrolyte, is absorbed by C, and is not pptd. by $Pb(OAc)_2$. It is dialysable to about the same extent as the sol. N and ash constituents of carrot extract. It does not resemble a vitamin and is probably not rhizopin, auxin, or inositol, but exhibits certain of the properties of bios. A. G. P.

Nitrogen metabolism of the crown gall and hairy root bacteria. H. A. Conner, W. H. Peterson, and A. J. Riker (J. Agric. Res., 1937, **54**, 621—628).—In media containing yeast infusion and glucose $\frac{1}{5}$ of the total N was changed into cellular protein by these organisms. NH_2-N in the medium was increased by growth of the crown gall but not by the hairy root bacteria. NH_4 salts were utilised by both. Omission of glucose from the medium largely increased NH_3 production but did not affect protein formation. Crown gall and attenuated crown gall organisms utilised NH_4NO_3 as sole source of N, $NH_4^{\cdot}$ being more effective than NO_3'. Polypeptide and NH_2-N were utilised with increased formation of cellular protein and NH_3. The N fraction pptd. by tungstic acid was less readily utilised. A. G. P.

Bacterial leaf spot of geranium. W. H. Burkholder (Phytopath., 1937, **27**, 554—560).—The causal organism (*Phytomonas geranii*, nov. sp.) is described and its ability to utilise a variety of C and N sources is examined. A. G. P.

Presence of micro-organisms in althæa leaves. J. Babička and A. Řídký (Časopis českoslov. Lék., 1936, **16**, 3—11; Chem. Zentr., 1936, i, 3363).—Characteristics of the organisms are described. H. N. R.

Carotenoids of purple bacteria. III. E. Schneider (Rev. Fac., 1936, **1**, No. 2, 74—80; Chem. Zentr., 1936, i, 3525; cf. A., 1934, 1265).—From cultures of S-free purple bacteria two carotenoid fractions are isolated. The spectrum of fraction I resembles that of lycopene. Fraction II is similar to phytoxanthene in solubility and adsorption properties, but its absorption spectrum is unlike that of xanthophyll. Both fractions consist of several very similar (? isomeric) components. The ratio of the pigments is similar to that of the chloroplast pigments of higher plants (chlorophyll : carotenoid = 2·75; I : II = 0·6). Carotenoids are probably concerned in the assimilation process. A. G. P.

Quantum yield of hydrogen and carbon dioxide assimilation in purple bacteria. C. S. French (J. Gen. Physiol., 1937, **20**, 711—735).—The rates of photoassimilation of H_2 and CO_2 by *Streptococcus varians* under various conditions are compared. Irradiation of thin suspensions of the bacteria with λλ 852 and 894 mμ shows that in this region the photo-reaction $2H_2 + CO_2$ requires 4 quanta. F. A. A.

Gum-producing bacteria.—See B., 1937, 716.

Optical activity of lactic acid produced by *Lactobacillus acidophilus* and *L. bulgaricus*. L. M. Kopeloff and N. Kopeloff (J. Bact., 1937, **33**, 331—334).—The *R* form of *L. acidophilus* produced *dl*-acid; that of *L. bulgaricus* produced the *dl*-acid in the first 6 fractions and the *d*-form in the 7th. *S* forms of both organisms yielded *d*-acid. A. G. P.

Growth factors for bacteria. III. Nutritive requirements of *Lactobacillus delbrückii*. E. E. Snell, E. L. Tatum, and W. H. Peterson. **IV. Acidic ether-soluble factor essential for growth of propionic acid bacteria.** H. G. Wood, E. L. Tatum, and W. H. Peterson (J. Bact., 1937, **33**, 207—225, 227—242; cf. this vol., 224).—III. Stimulative effects of aq. extracts of potatoes on the growth of lactic bacteria, notably *L. delbrückii*, are recorded. Tryptophan (I) is essential for the growth of this organism. For luxuriant growth in the presence of hydrolysed casein and (I) two unknown factors are necessary. One occurs in the Neuberg filtrate or the acid–Et_2O extract of an aq. potato extract and is possibly an acid of low mol. wt.; the other is basic and occurs in peptone. Both are destroyed by acid hydrolysis. Both are present in liver extracts.

IV. An Et_2O-sol. factor from yeast extract is indispensable for growth of propionic bacteria on a synthetic $(NH_4)_2SO_4$ medium. Hydrolysed casein improves growth and permits repeated sub-culturing on the synthetic nutrient. The factor is found in all materials (yeast, maize, potato and liver extracts) which favour growth of the organism. It differs chemically and biologically from hepatoflavin, vitamin-B_1, pantothenic acid, indolylacetic acid, inositol, nicotinamide, and the *sporogenes* vitamin. A. G. P.

Cultivation of cellulose-splitting bacteria on membranes of *Acetobacter xylinum*. M. Aschner (J. Bact., 1937, **33**, 249—252).—The organisms

may be detected within 48 hr. by liquefaction of media containing *xylinum* cellulose. A. G. P.

Fermentation with butyric acid bacilli. II. H. PELDÁN (Suomen Kem., 1937, **10**, B, 13—14).—No MeCHO can be detected when glucose is fermented by the bacilli in presence of excess of Na_2SO_3 (cf. this vol., 224). M. H. M. A.

Dissimilation of pyruvic acid by *Clostridium butylicum*. R. W. BROWN, O. L. OSBURN, and C. H. WERKMAN (Proc. Soc. Exp. Biol. Med., 1937, **36**, 203—205).—Cell suspensions of *Cl. butylicum* convert $AcCO_2H$ into AcOH, $PrCO_2H$, CO_2, and H_2. H_2 donated by $AcCO_2H$ can reduce $PrCO_2H$ only when the p_H is <6·3. HCO_2H is not decarboxylated and lactic acid is not dehydrogenated. W. O. K.

Reaction with iron compounds for determination of *B. anthracis* and of its pathogenicity. E. DE ANGELIS (J. Bact., 1937, **33**, 197—206).—A colour reaction between Fe^{II} or Fe^{III} salts and a substance produced by *B. anthracis* differentiates this organism from other species, distinguishes between virulent and avirulent types, and indicates the potency of different strains. A. G. P.

Respiration of *B. coli*. F. L. WYND (Proc. Soc. Exp. Biol. Med., 1937, **36**, 343—345).—The rate of O_2 uptake of *B. coli* exhibits two cycles of respiratory activity. H. G. R.

Effect of metabolites on growth and differentiation in the colon group. M. J. POWERS and M. LEVINE (Proc. Soc. Exp. Biol. Med., 1937, **36**, 274—276).—Cultures of *coli–aërogenes* organisms contain substances which show sp. growth-inhibiting effects on homologous strains. P. G. M.

Methylene-blue reduction test for distinguishing between *coli* and *aërogenes* types of lactose-fermenting organisms in water and fæces. T. N. S. RAGHAVACHARI and P. V. S. IYER (Indian J. Med. Res., 1935, **23**, 463—466).—The test is conclusive for *B. coli*, but not for *B. aërogenes* and the intermediate types of coliform organisms. R. N. C.

Changes in the fermentation by *B. coli* in presence of *Enterococcus*. M. MILLET, R. REFETOFF, and L. FINCLERC (Compt. rend. Soc. Biol., 1937, **125**, 391—392).—*B. coli* produces fermentation only when grown in a medium where *Enterococcus* fermentation has commenced. H. G. R.

Comparison of metabolic activities of *Aërobacter aërogenes*, *Eberthella typhi*, and *Escherichia coli*. C. E. CLIFTON (J. Bact., 1937, **33**, 145—162).—Data for growth rates, oxidation-reduction potential, $K_3Fe(CN)_6$-reduction, and O_2–CO_2 exchange are given. The concns. of peptone, oxidant, and of organisms are closely concerned in controlling metabolic activity. The rate of metabolism per cell is max. during the early phases of growth because of the increased size of the cells and the higher concn. gradient of nutrients between cells and substrate. A. G. P.

Acid production by the *Escherichia–Aërobacter* group of bacteria as indicated by dissolved metallic iron. A. V. SYROCKI, J. E. FULLER, and R. L. FRANCE (J. Bact., 1937, **33**, 185—192).—In peptone–glucose media bacteria of this group produce sufficient acid to cause dissolution of Fe filings placed in the medium. Addition of 0·3% of K_2HPO_4 to the nutrient prevented dissolution of Fe by *A. aërogenes*, but not that by *E. coli*. A. G. P.

Bacterial production of histamine from urea. M. L. BRUHL, G. UNGAR, and A. LEVILLAIN (Compt. rend., 1937, **204**, 1222—1224).—Growth of strains of *B. coli* and *Pneumobacillus* in media containing urea as sole source of N is accompanied by production of traces of histamine. F. O. H.

Mechanism of bacteriolysis *in vitro*. A. GRIMBERG, S. MUTERMILCH, E. AGASSE-LAFONT, and H. PELLIER (Compt. rend. Soc. Biol., 1937, **125**, 521—523).—Vigorous multiplication of *B. coli* is observed after a few hr. even when the blood is not sufficiently diluted to prevent entirely the lytic action of alexin. The latter is totally destroyed in the first few hr. and there is then no further hindrance to bacterial growth. H. G. R.

Cell size and metabolic activity at various phases of the bacterial culture cycle. E. HUNTINGTON and C. E. A. WINSLOW (J. Bact., 1937, **33**, 123—144).—The greater metabolic activity of cultures of *E. coli*, *Salmonella gallinarum*, and *S. pullorum* in the lag period than in the logarithmic phase is not adequately explained by the increase in cell vol. Cells appearing at the end of the lag and early in the logarithmic phase are distinct in respect of metabolism, size, and subsequent development. The characteristics of " physiological youth " are an increased metabolic rate followed, in order, by increased cell size and increased rate of division. After peak vals. are reached, size and metabolism decrease rapidly whereas the division rate persists for some time. Stimulation of cell division by glucose is not accompanied by increased production of CO_2. A. G. P.

Nutrition of *Staphylococcus aureus*. Activities of nicotinamide, aneurin (vitamin-B_1), and related compounds. B. C. J. G. KNIGHT (Biochem. J., 1937, **31**, 966—973).—Aneurin (I) ($10^{-7}M$) + nicotinic acid ($10^{-5}M$) or its amide can completely replace the staphylococcus growth factor, enabling the growth of 12 typical strains of *S. aureus* to take place in a medium of known chemical composition. The pyrimidine + the thiazole corresponding with (I) can also be utilised by the organisms instead of the complete mol. but other closely related substances, *e.g.*, (I) lacking the $CH_2{\cdot}CH_2{\cdot}OH$ group in the 5 position of the thiazole ring, are inactive. Similarly 4 amino - 5 - aminomethyl - 2 - methylpyrimidine + 4-methyl-5-β-hydroxyethylthiazole permits growth but substitution of 4-OH for the $4\text{-}NH_2$ in the pyrimidine nucleus causes loss of activity. P. W. C.

Determination of staphylococcal types by fermentation of mannitol. L. A. JULIANELLE (Proc. Soc. Exp. Biol. Med., 1937, **36**, 117—119).—The immunological types *A* and *B* of 102 cultures of staphylococci were differentiated, within 5%, by fermentation of mannitol. P. G. M.

Lipins of tubercle bacilli. XLVII. Composition of the avian tubercle bacillus wax. R. E. Reeves and R. J. Anderson (J. Amer. Chem. Soc., 1937, **59**, 858—861; cf. A., 1936, 1028).—The wax of avian tubercle bacilli, purified by pptn. by MeOH from $CHCl_3$ or Et_2O, has m.p. 54—55°, $[\alpha]_D$ +38·6° in $CHCl_3$, I val. 4·5, and contains C 75·38, H 12·14%, and P a slight trace, a second fraction with m.p. 53—55°, $[\alpha]_D$ +17·7° in $CHCl_3$, and I val. 8·7, being also obtained. When hydrolysed it gives trehalose 11·3—13·3, EtOH-insol. K soaps 80—82, acids giving sol. K salts 2·2—2·6, and neutral material 9·1—10·8%. The neutral material is mainly *d*-eicosan-β-ol, $[\alpha]_D$ +6·79° in Et_2O (3 : 5-*dinitrobenzoate*, m.p. 77·5—78°, $[\alpha]$ + 23·4° in $CHCl_3$), with some *d*-octadecan-β-ol, m.p. 53—54°, $[\alpha]_D$ +4·84° in $CHCl_3$ (3 : 5-*dinitrobenzoate*, m.p. 71—72°, $[\alpha]_D$ +25·3° in $CHCl_3$), both identified by mixed m.p. and oxidation to the ketones. The acids from the insol. K salts were optically active, unknown OH-acids and were separated by ligroin into fractions, (I) about $C_{38}H_{74}O_3$, m.p. 69—70°, $[\alpha]_D$ +5·6° in $CHCl_3$, I val. 6·5 [active H 0·92; *Ac*, m.p. 54—55°, and *Br*- (22·4%) -derivative, m.p. 47—49°; *Me* ester, m.p. 54—55°], and (II) about $C_{88}H_{174}O_3$, m.p. 60—61°, $[\alpha]_D$ + 5·5° in $CHCl_3$, I val. 5·5 [active H 0·82; *Ac*, m.p. 48—57°, and *Br*- (22·9%) -derivative, m.p. 43—49°; *Me* ester, m.p. 49—50°]. The acids from the sol. salts were also a complex mixture of low I val. The common acids and glycerol were absent. R. S. C.

Fatty acids of tubercle bacillus. T. Wagner-Jauregg (Z. physiol. Chem., 1937, **247**, 135—140).—The $COMe_2$-sol. fat, on decolorisation and hydrogenation, yields cerotic acid, m.p. 80°, and, as Me esters, tuberculostearic (cf. Spielman, A., 1934, 1141) and phthioic acids. A mixture of Me ester fractions, following conversion into the acids, yields a 2 : 4 : 6-*tribromoanilide*, m.p. 66—68°, corresponding with an acid $C_{29}H_{58}O_2$. F. O. H.

Effect of saponin on the vitality of the tubercle bacillus and on the evolution of experimental tuberculosis in the guinea-pig. B. Ananiadès and E. Matthaiaki (Compt. rend. Soc. Biol., 1937, **125**, 415—417).—No effect was observed with 0·25% saponin on the growth of the bacillus and the course of the infection was aggravated. H. G. R.

Racemisation of the proteins of *Vibrio cholerœ* and related organisms. I. Diamino-acids. II. Monoamino-acids. B. N. Mitra (Indian J. Med. Res., 1936, **23**, 573—578, 579—588).—I. Racemisation of the proteins with dil. alkali does not affect the optical activity of lysine in either protein, but histidine is completely racemised in both. Arginine is partially racemised in protein-I (I), and completely in protein-II (II).

II. Alanine, valine, tyrosine, and aspartic acid are completely racemised in both proteins. Leucine is racemised only in (I), glutamic acid only in (II). Proline is racemised more completely in (II) than in (I), whilst hydroxyproline (III) is not racemised in either protein. Extraction with $Bu^{\beta}OH$ simplifies the isolation of the individual NH_2-acids. $Bu^{\beta}OH$ does not appear to extract glycine and (III) completely. R. N. C.

Respiration and glycolysis of the cholera and cholera-like vibrios. R. W. Linton, B. N. Mitra, and D. N. Mullick (Indian J. Med. Res., 1936, **23**, 589—599).—Metabolism is most active in group I, and least in group III and the medusa-head organisms. Aërobic glycolysis does not take place in the El Tor group. Variation of the strain in chemical structure and classification induces corresponding changes in metabolism. Metabolism in rough strains is < in smooth strains. The source, chemical structure, and metabolism of the vibrios can be correlated. R. N. C.

Preparation and properties of a specific polysaccharide from a strain of *Vibrio cholerœ*. D. L. Shrivastava and S. C. Seal (Proc. Soc. Exp. Biol. Med., 1937, **36**, 157—161).—A polysaccharide, serologically active in concns. ≮ 1 : 12,000,000, isolated from Inaba variant strain of the vibrio, gives N 2·62, ash 7·8%, α +58°, and on hydrolysis yields glucose. In various strains of cholera vibrios a relation can be demonstrated between serological interactions and the composition of the sp. polysaccharide. W. O. K.

Study of dehydrogenation by washed [resting] bacteria by a modification of the methods of Thunberg and Quastel and of Braun and Wörderhoff. D. Bach (Bull. Soc. Chim. biol., 1937, **19**, 87—99).—The method is described and its application exemplified (cf. A., 1926, 434; Zentr. Bakt., 1935, **128**, 50). F. O. H.

Improved Thunberg technique for bacterial oxidations. F. H. Johnson (Proc. Soc. Exp. Biol. Med., 1937, **36**, 387—390).—Deaëration is affected by a stream of H_2 or N_2. α-Methylglucoside is readily dehydrogenated by *Achromobacter fischeri*. H. G. R.

Bacteriophages of the lactic bacteria of milk. P. Mazé (Compt. rend. Soc. Biol., 1937, **125**, 412—415).—The bacteriophage is stable for 5 min. at 80° but is destroyed in 5 min. at 85°. H. G. R.

Purified bacteriophage from lysogenic cultures. C. A. Colwell (Proc. Soc. Exp. Biol. Med., 1937, **36**, 100—103).—Bacteriophage from a non-sucrose-fermenting strain of *B. coli*, when purified as described, is more sensitive to chemical and physical agents than homologous broth phage. It is inactivated in 30 min. at 65° (broth phage 75°), and by 50% $COMe_2$ in 24 hr. (broth phage is only slightly affected). P. G. M.

Direct isolation of human influenza virus in tissue culture medium and on egg membrane. T. Francis, jun. and T. P. Magill (Proc. Soc. exp. Biol. Med., 1937, **36**, 134—135).—The virus was cultivated directly on chick embryo–Tyrode medium and also on the chorio-allantoic membrane of the developing chick. W. O. K.

Chemistry of influenza and other viruses. M. Copisarow (Chem. and Ind., 1937, 641).—A discussion.

Inactivation of vaccinia virus by ascorbic acid and glutathione. I. J. Kligler and H. Bernkopf (Nature, 1937, **139**, 965—966; cf. A., 1936, 1423).—Small amounts of vitamin-*C* can inactivate

infective doses of vaccinia virus inoculated into a rabbit testicle. Glutathione (I) acts similarly but is less effective. The action probably depends on the oxido-reducing properties of *-C* and (I). L. S. T.

***F*-Type potato virus in Australia.** J. G. Bald (Nature, 1937, **139**, 674).—The potato virus recently isolated in Ireland has been found in Australia in potatoes with a slight aucuba mottling of the foliage. The virus causes severe necrosis on pepper, and does not protect potato plants from infection with *Y*-type viruses. *Solanum nigrum* is an important host. L. S. T.

Correlation between movement of the curly-top virus and translocation of food in tobacco and sugar beet. C. W. Bennett (J. Agric. Res., 1937, **54**, 479—502).—Invasion of the plant by the virus is but little related to the rate of multiplication or concn. gradient of the virus but depends on other physiological processes, notably nutrient transport. In beet and tobacco movement of the virus is retarded by conditions causing excessive carbohydrate production and increased by food deficiency. The use of virus as an indicator of food translocation in plants is suggested. A. G. P.

Relation of Stanley's crystalline tobacco virus protein to intracellular crystalline deposits. H. P. Beale (Contr. Boyce Thompson Inst., 1937, **8**, 413—431).—The intracellular deposits are examined. Transformation of cryst. plates into needles by mineral acids is shown in several hosts. The plates are probably more complex than, but are the source of, Stanley's cryst. virus. A. G. P.

Tobacco mosaic virus : inactivation by ultra-violet light. W. C. Price and J. W. Gowen (Phytopath., 1937, **27**, 267—282).—Survival vals. of the virus exposed to ultra-violet light follow a simple exponential curve. The rate of inactivation is greatest in the most highly purified material (solution of cryst. virus). A. G. P.

Pimelic acid as a growth-accessory for the diphtheria bacillus. J. H. Mueller (J. Biol. Chem., 1937, **119**, 121—131).—Growth-accelerating action of cow's urine was traced to pimelic acid (I), of which 0·6 g. could be isolated from 100 gals. of urine ; the initial content is indicated to be 0·001%. Max. growth effect is obtained in media containing $0{\cdot}025 \times 10^{-6}$ g. of (I) per c.c. Azelaic acid was also isolated from the urine but does not promote the bacterial growth. Liver extract has a similar action to that of urine, but less intense, and may thus also contain smaller amounts of (I), which, however, could not be isolated from it. R. M. M. O.

Rôle of some growth factors in the production of diphtheria toxin. A. Mustafa (Compt. rend. Soc. Biol., 1937, **125**, 615—617).—Addition of yeast extract to the medium accelerates production of the toxin. H. G. R.

Growth factors for propionic and lactic acid bacteria. H. G. Wood, A. A. Anderson, and C. H. Werkman (Proc. Soc. Exp. Biol. Med., 1937, **36**, 217—219).—Strains of propionic bacteria which failed to develop satisfactorily on an NH_2-acid-free medium grew better and produced larger quantities of acid if lactoflavin was present. The growth requirements of various lactic bacteria are discussed. W. O. K.

Influence of deuterium oxide on growth and morphology of lactobacilli. H. H. Weiser (Proc. Soc. Exp. Biol. Med., 1937, **36**, 151—152).—D_2O (≯5%) in whey–broth media had no appreciable effect on the growth and morphology of strains of *L. acidophilus* and *L. bulgaricus*. W. O. K.

Bactericidal and antitoxic action of vitamin-*C*. J. von Gagyi (Klin. Woch., 1936, **15**, 190—195; Chem. Zentr., 1936, i, 3358; cf. A., 1935, 1527).—Vitamin-*C* inhibits the activity of bacteria in the organism and detoxicates and lowers the virulence of pathogenic bacteria, *e.g.*, diphtheria bacillus. A. G. P.

Bactericidal action of the intestinal fluid of the silkworm, *Bombyx mori*, L. Y. Nakazawa (Bull. Sericult., 1937, **9**, 159—166).—Variations in the bactericidal activity (against *B. prodigiosus*) of the fluid due to nutrition and condition of the silkworm and to changes in temp. and dilution of the fluid are described. An alkaline substance appears to be the active principle. F. O. H.

Action of radiations on bacteria. III. γ-Rays on growing and on non-proliferating bacteria. D. E. Lea, R. B. Haines, and C. A. Coulson (Proc. Roy. Soc., 1937, B, **123**, 1—21 ; cf. A., 1936, 641).—The lethal action of γ-rays on aq. suspensions of *B. coli* and *B. mesentericus* gives exponential survival curves. The mean lethal ionisation dosages approx. = those obtained for β-rays when rate of death was very much greater. In a nutrient medium lethal action on and growth of *B. coli* are independent. Abnormally long, filamentous forms of *B. coli* are probably due to the inhibiting effect of radiation on division. E. M. W.

Photodynamic action of dyes on bacteria. T. Tung and S. H. Zia (Proc. Soc. Exp. Biol. Med., 1937, **36**, 326—330).—Eosin, after exposure to light, has 10,000 times its native bactericidal activity (methylene-blue 100 times). Mercurochrome is more bacteridical in the absence of light, whilst trypaflavine is intermediate between the two. The reaction of bacteria to Gram's stain parallels their susceptibility to photodynamic action. P. G. M.

Bacteriostatic and bactericidal action of Great Salt Lake water. C. E. Zobell, D. Q. Anderson, and W. W. Smith (J. Bact., 1937, **33**, 253—262).—The H_2O kills sewage, soil, and oral organisms, and carries a flora of obligate halophytes requiring a min. salt content of 13%. A. G. P.

Carotenoids and other lipoid-soluble pigments in the sea and in deep marine mud.—See A., I, 430.

Phosphorus compounds in the muscles of adrenalectomised rabbits. M. F. de Mira and A. da Cruz (Compt. rend. Soc. Biol., 1937, **125**, 552—554).—Muscle-P could not be correlated with symptoms of adrenal insufficiency. H. G. R.

Asthenic effect of adrenalectomy and the physico-chemical properties of muscle. G.

Benetato and R. Oprean (Bull. Soc. Chim. biol., 1937, **19**, 69—86; cf. A., 1936, 750).—Adrenalectomy in frogs reduces the p_H and, by diminishing the phosphagen content and modifying the muscle-proteins, the buffering power of the muscles. F. O. H.

Chlorine and sodium chloride content of muscle and brain tissue after adrenalectomy. M. Cahane (Bull. Soc. Chim. biol., 1937, **19**, 353—356).—After adrenalectomy in rats, the Cl and NaCl contents of muscle and brain tissue are > those of normal rats. A. L.

Potassium in adrenal insufficiency. C. I. Urechia, G. Benetato, and Retezeanu (Compt. rend. Soc. Biol., 1937, **125**, 191—192).—After adrenalectomy in frogs, a decrease in K in the tissues, particularly the brain, occurs. H. G. R.

Reaction of adrenaline on cat and guinea-pig uterus during the different stages of the sexual cycle and the effect of hormones. P. Holtz and K. Wöllpert (Arch. exp. Path. Pharm., 1937, **185**, 20—41).—Adrenaline always increases the action of follicular or corpus luteum hormone when these are acting individually on the uterus but is inhibitory when both hormones are acting simultaneously. P. W. C.

Effect of barbiturates on the increased secretion of adrenaline after insulin. J. La Barre and G. Kettenmeyer (Compt. rend. Soc. Biol., 1937, **125**, 377—378).—The increased secretion of adrenaline is suppressed in the dog. H. G. R.

Synergism of adrenaline and pituitary hormone. Adrenaline glycogenolysis. L. Képinov (Compt. rend., 1937, **204**, 1218—1220; cf. this vol., 228).—The principle occurring in the liver (frog) synergising adrenaline in its glycogenolytic function is of pituitary origin. F. O. H.

Physiological properties of extracts of the adrenal cortex. A. Gradinesco and N. Santa (Compt. rend. Soc. Biol., 1937, **125**, 197—200).—No effect was observed on the capillaries at the maintenance dosage, but on increasing this a vaso-constricting and hypotensive action developed. The extracts had an intense mydriatic action which cannot be attributed to adrenaline. H. G. R.

Effect of adrenal cortical hormone on renal excretion of electrolytes in normal subjects. G. W. Thorn (Proc. Soc. Exp. Biol. Med., 1937, **36**, 361—364).—Excretion of $Na^{\cdot}$, Cl', and H_2O was decreased and that of inorg. PO_4''' increased. H. G. R.

Resynthesis of muscular glycogen in the hypophysectomised toad. R. G. Dambrosi (Compt. rend. Soc. Biol., 1937, **125**, 539—541).—Resynthesis is decreased but returns to normal if the principal lobe is implanted. H. G. R.

Glycogen and the pituitary. B. A. Houssay, A. Biasotti, and R. G. Dambrosi (Compt. rend. Soc. Biol., 1937, **125**, 542—544).—In hypophysectomised animals glycogenolysis is rapid during fasting, but is decreased by insulin and adrenaline. H. G. R.

Effects of sugar, glycerol, and urea on hormones of cattle anterior pituitary glands. S. J. Hayward and L. Loeb (Proc. Soc. Exp. Biol. Med., 1937, **36**, 250—253).—The characteristic effect of immersion of the glands in sucrose solutions (>20%) or in glycerol (<50%) is the preservation of the hormones which cause theca and granulosa luteinisation, together with some of the thyrotropic activity. Glands kept in urea solutions (up to 10% and also saturated) at 37°, 40°, and room temp. produce maturation of follicles without other ovarian changes, whilst the thyrotropic activity is usually destroyed. P. G. M.

Influence of extracts of anterior lobe of pituitary on glucose oxidation and glycogen storage. H. S. Meyer, L. J. Wade, and C. F. Cori (Proc. Soc. Exp. Biol. Med., 1937, **36**, 346—348).—A decrease in carbohydrate oxidation and an increase in liver- and muscle-glycogen was observed after intraperitoneal injection of the extract. H. G. R.

Action of the pituitary hormone "lipoitrin" on fat and carbohydrate metabolism. E. Kolli (Bull. Biol. Méd. exp. U.R.S.S., 1936, **2**, 290—291).—The hormone (I) controls fat absorption by the liver, the absorption being accompanied by loss of glycogen. Hence (I) affects carbohydrate metabolism. Nutr. Abs. (*m*)

Experimental alteration of galactin content of rat pituitary. R. P. Reece and C. W. Turner (Proc. Soc. Exp. Biol. Med., 1937, **36**, 283—285).—Ovariectomy decreases the galactin content of the pituitary. Injection of œstrogens into ovariectomised animals increases the content over that of spayed non-treated controls. Daily injection of 500 international units in normal males increases the content per gland and the concn. within the gland. P. G. M.

Colorimetric determination of sex hormones in human urine. H. Wu and C. Y. Chou (Chinese J. Physiol., 1937, **11**, 413—428).—Female sex hormones are determined as theelin by a colorimetric method based on Kober's reaction with phenolsulphonic acid (A., 1931, 1195) and male hormones are determined colorimetrically as androsterone using Zimmermann's reaction with m-$C_6H_4(NO_2)_2$ (A., 1935, 1032). J. L. C.

Contents of sex hormones in normal and pathological urine. C. Y. Chou and H. Wu (Chinese J. Physiol., 1937, **11**, 429—436).—Vals. for the male and female hormone contents, determined colorimetrically as androsterone and theelin respectively, are reported for the urines of normal male adults, non-pregnant and pregnant females, children of both sexes, and some pathological urines. J. L. C.

Production of sex hormone in absence of vitamin-*E*. B. Kudrjashev (Bull. Biol. Méd. exp. U.R.S.S., 1936, **1**, 345—346).—Addition of large amounts of vitamin-*E* to the diet of rats which have been long deprived of -*E* does not cause regeneration of the atrophied seminal vesicles and prostate. Injections of prolan, however, stimulate the hormonal activity of the testis in the -*E*-deficient rat and restore normal structure of secondary sexual organs. Nutr. Abs. (*m*)

Effect of acid-hydrolysis on the yield of androgenic and œstrogenic activities from human

urine. D. H. Peterson, T. F. Gallagher, and F. C. Koch (J. Biol. Chem., 1937, **119**, 185—188).—Androgenic activity (extractable by C_6H_6) of urine is approx. doubled by boiling (in air or CO_2) with 10% HCl for 15 min. but on longer boiling it decreases, reaching the original val. after several hr. Under the same conditions, œstrogenic activity is completely liberated after 15 min. with no loss on longer boiling. R. M. M. O.

Extracts containing the gonad-stimulating hormone of pregnant mare's serum. G. F. Cartland and J. W. Nelson (J. Biol. Chem., 1937, **119**, 59—67).—Fractional pptn. of the plasma with $COMe_2$ or EtOH, removal of impurities by adjustment of p_H, and re-pptn. with an increased concn. of $COMe_2$ gives the hormone (I) in 60—90% yield as a dry, H_2O-sol. powder. Pptn. at the isoelectric point gave small amounts of (I) assaying at 140 rat units per mg. (I) is rapidly destroyed by conc. acids, and by exposure to 4% CH_2O for 3 hr. at p_H 8. It is stable at 60° at p_H 6, 7, and 8. Incubation with trypsin at p_H 7·5—8·7 for 6 hr. at 40° completely destroys (I), but it is not attacked by invertase or emulsin at p_H 6·5 for 1 hr. at 40°. J. N. A.

Supposed œstrogenic action of a cholesterol preparation. P. Rondoni, V. Carminati, and A. Corbellini (Z. physiol. Chem., 1937, **247**, 225—226).—Experiments indicating the absence of œstrogenic activity from cholesterol are described in a further reply to Voss and Rabald (this vol., 101). F. O. H.

Seasonal variation in serum-calcium. Relationship with ovarian activity in the bitch. J. Cheymol and A. Quinquaud (Compt. rend. Soc. Biol., 1937, **125**, 320—322).—Max. vals. were observed after periods of "heat," no variation occurring in ovariectomised animals. H. G. R.

Relationship between rat and mouse units of œstrogenic activity. L. W. Rowe and A. E. Simond (J. Amer. Pharm. Assoc., 1937, **26**, 378—380; cf. A., 1936, 644).—Standards for œstrogenic preps. are discussed. One rat unit is equiv. to 5, 0·2, and 1 mouse units for ketohydroxyœstrin (theelin), theelin benzoate, and dihydroxyœstrin benzoate, respectively. F. O. H.

Androgenic activity of ovarian extracts. A. S. Parkes (Nature, 1937, **139**, 965).—Androgenic activity, due apparently to the presence of substances of the androsterone–testosterone group, has been demonstrated in two crude EtOH–$COMe_2$–Et_2O extracts of pig ovaries. The origin of the androgenic material in the normal human female is discussed. L. S. T.

Comparison of the potencies of some androgenic sterols. D. R. McCullagh and B. F. Stimmel (Proc. Soc. Exp. Biol. Med., 1937, **36**, 337—340).—Testosterone propionate or its oxime produces a more prolonged effect than testosterone, androsterone, or Δ^5-androstenediol in single injections. The max. effect occurs after 3 days. P. G. M.

Relationship between the male gonads and the adrenal gland [in mice]. W. Cramer and E. S. Horning (Lancet, 1937, **232**, 1330—1331). L. S. T.

Effects of androsterone and testosterone on œstrous cycle of rats. L. G. Browman (Proc. Soc. Exp. Biol. Med., 1937, **36**, 205—208).—Daily injections of testosterone (0·5—3·0 mg.) or of androsterone (3·0—5·0 mg.) in sesamé oil into normal mature female rats suppress the œstrus cycle as expressed by the vaginal smear. W. O. K.

Isolation of $\Delta^{3:5}$-androstadien-17-one from the urine of a man with a malignant tumour of the adrenal cortex. H. Burrows, J. W. Cook, E. M. F. Roe, and F. L. Warren (Biochem. J., 1937, **31**, 950—961).—The patient excreted an excessive amount (3000 international units per litre) of œstrogenic hormone, believed to be œstrone, and showed signs of feminism. From 30 litres of urine were isolated (*a*) 0·75 g. of *p*-cresol (3 : 5-*dinitrobenzoate*, m.p. 186°; *p-phenylbenzoate*, m.p. 126°); (*b*) 0·4 g. of a *ketone*, $C_{19}H_{26}O$, m.p. 88—89°, $[\alpha]_D^{20}$ −30·4° in EtOH, [*oxime*, m.p. 164—170°; *semicarbazone*, m.p. 291—292° (rapid heating)], which was shown to contain two ethylenic linkings, giving 17-androstanone on reduction, and to be identical with $\Delta^{3:5}$-*androstadien*-17-*one* (I), prepared by dehydration of dehydroandrosterone (*semicarbazone*, m.p. 287—288°), the latter on reduction with EtONa giving androstane, m.p. 49°, together with 17-hydroxyandrostane, m.p. 156—158°; (*c*) a *ketone*, $C_{19}H_{28}O_3$ (II), m.p. 269—270°; (*d*) a *ketone*, probably $C_{21}H_{32}O_3$ (III), isolated as the *oxime*, m.p. 200—202°. (I) had a weak comb-growth-promoting activity in capons but had no œstrogenic or cortical hormone activity. (II) and (III) had no appreciable œstrogenic activity. When the semicarbazone of dehydroandrosterone was heated with NaOEt and the product brominated, oxidised, and debrominated, 3-*androstanone*, m.p. 97—98° (*semicarbazone*, m.p. 238—240°), was produced. P. W. C.

Co-operative activity of testosterone propionate with Δ^5-androstenediol and with œstradiol in male rats. V. Korenchevsky and M. Dennison (Biochem. J., 1937, **31**, 862—864).—Using castrated rats, co-operative activity between testosterone propionate (I) and androstenediol was seen in the effects on all the sexual organs and on the thymus. Addition of œstradiol to (I) in the doses used caused an increase in the wt. of the seminal vesicles (slight) and of the adrenals (considerable), a decrease in the rate of involution of the thymus (slight), and a gain in body-wt. (considerable). P. W. C.

Response of anterior pituitary of immature castrated rat to testosterone and related compounds. J. M. Wolfe and J. B. Hamilton (Proc. Soc. Exp. Biol. Med., 1937, **36**, 307—310).—Injection of testosterone, its acetate or propionate suppressed the increase in size and no. of basophile cells normally occurring after castration. The propionate is the most effective in inducing degranulation of the cells. P. G. M.

Inhibiting action of testosterone on the plumage of a castrated Sebright cock. C. Champy (Compt. rend. Soc. Biol., 1937, **125**, 329—330).—The anti-masculinising effect of large doses of testosterone acetate (cf. A., 1936, 1031) is very marked

and it is not necessary to assume an abnormal testicular secretion to explain the "Sebright effect." H. G. R.

Influence of various hormones on urinary elimination of creatine and creatinine. F. Bühler (Z. ges. exp. Med., 1935, **96**, 821—844; Chem. Zentr., 1936, i, 3526).—Increased elimination of creatine (I) and creatinine (II) following castration of adult animals is corr. by administration of testicular hormone, large doses of which cause complete disappearance of creatinuria. Small doses of the female sexual hormone decrease and large doses increase the elimination. Orastin prevents elimination of (I) by intact and by castrated animals. Prolan has no action on the (I) metabolism of castrated or immature animals but causes cessation of creatinuria in intact adults. The thyrotropic hormone (III) of the pituitary increases urinary (I) and (II) in dogs but not in rabbits. Thyroxine increases the (I) content in all animals. Cortin has no action. In dogs with pituitary damage prolan, (III), and thyroxine produce and orastin prevents creatinuria. A. G. P.

Increase in blood-cholesterol in man after castration. G. Teilum (Compt. rend. Soc. Biol., 1937, **125**, 577—580).—The increase was observed after 6 months and was independent of the age of the subject. H. G. R.

Biological detection of two new hormones using *Rhodeus amarus* as detector. J. J. D. de Wit (Proc. K. Akad. Wetensch. Amsterdam, 1937, **40**, 559—562).—Pregnancy urine contains an active substance, lutidin (I), which when injected into *R. amarus* increases the length of the ovipositor. (I) cannot be extracted by Et_2O and is thermostable. Follicular liquor from pig ovaries contains oviductin, which behaves similarly, but is sol. in Et_2O. Aq. extracts of ovaries and corpora lutea from pigs, human placentæ, bull and ram testes, and cattle adrenals were all active in the fish test, whilst extracts of thyroid, pancreas, brain, pituitary, pineal body, thymus, liver, and small intestine were inactive. The urine of a man and woman with cancer contained much active substance. During pregnancy, the concn. of (I) in urine remains const. from the second month. During menstruation there is a decrease in (I), which rises again to a max. 19—26 days after. J. N. A.

Crystalline insulin. IX. Method of crystallisation of insulin. B. Stallmann (Arch. exp. Path. Pharm., 1937, **185**, 77—80).—Attempts to use Abel's method for crystallisation of German samples of insulin failed and good yields of cryst. material, m.p. 243° (decomp.), were obtained only when the operation was carried out in presence of the acetates of Zn and Fe. P. W. C.

Constitution of insulin. II. Reduced insulin preparations. A. White and K. G. Stern (J. Biol. Chem., 1937, **119**, 215—222).—Original (I) and reduced native insulin (II) (this vol., 102) are identical in tyrosine, free NH_2, and total S content, also in mol. wt. (ultracentrifuge), isoelectric point, viscosity, and ultra-violet absorption. Reoxidation of (II) at p_H 7·55 by air in presence of minute traces of $Cu^{\cdot\cdot}$ or $Fe^{\cdot\cdot}$ results in disappearance of ·SH groups, and almost complete loss of physiological activity. Under similar treatment (I) loses 20—38% of its activity. E. W. W.

Treatment of diabetes. Clinical and experimental observations with new insulins. T. I. Bennett, T. M. Davie, D. Gairdner, and A. M. Gill (Lancet, 1937, **232**, 1319—1323).—The slower action of protamine insulin (Hagedorn), protamine insulin (with Zn) suspension, and Zn-cryst. protamine insulin as compared with ordinary insulin is confirmed. This protracted action is accompanied by the danger of prolonged hypoglycæmia. L. S. T.

Organ and tissue metabolism. Carbohydrate metabolism in the hind legs of dogs and the effect on it of insulin. Y. Kaneda (Mitt. med. Akad. Kioto, 1936, **18**, 1251—1261).—In dogs, administration of insulin (I) results in decrease in the free sugar content of the blood, the effect being more noticeable in the venous than in the arterial blood. The bound blood-sugar diminishes in 1—3 hr. after (I) injection, then increases slowly to the normal val. The differences in the vals. for the bound and free sugar are small. There is no reason to suppose that free blood-sugar is changed into bound by the action of (I). Nutr. Abs. (*m*)

Modification of insulin action by simultaneous administration of glucose. P. Levi (Policlinico, 1936, **43**, 533—539, 609—614).—In hyperthyroidism the responses to insulin and glucose are exaggerated and that to both combined is a more marked hyperglycæmia with absence of secondary hypoglycæmia. Nutr. Abs. (*m*)

Insulin resorption in the intestines. F. Chrometzka and W. Wedderer (Z. ges. exp. Med., 1936, **97**, 640—644; Chem. Zentr., 1936, i, 3355).—Insulin is resorbed in the small intestine and produces its normal action. Injection into the colon increases blood pressure. The antagonistic effect is ascribed to mol. rearrangement. A. G. P.

Quantitative assay of insulin effect. P. Heinbecker, M. Somogyi, and T. E. Weichselbaum (Proc. Soc. Exp. Biol. Med., 1937, **36**, 399—401).—No proportionality was observed between insulin dosage and the area enclosed by the blood-sugar curve. H. G. R.

Chemical changes in blood in tetany due to parathyroid deficiency and on administration of parathormone. S. Siwe (Z. Kinderheilk., 1935, **57**, 383—395; Chem. Zentr., 1936, i, 3530).—Parathyroid insufficiency affects blood-Ca quickly and the -P later. The increase in -P does not affect min. -Ca vals. in spite of persistent tetany. The proportion of ultrafilterable Ca never becomes < that corresponding with the ionised Ca at the existing p_H. Administration of parathormone increases blood-Ca and notably the ultrafilterable Ca in arterial blood, vals. for which may be double those for venous blood. The corresponding P vals. vary (to 50%) in the same manner. A. G. P.

Relation between thyroid hormone and vitamin-A. W. Fleischmann and S. Kann (Wien. klin. Woch., 1936, **49**, 1488—1489).—Mice are made more resistant to MeCN by treatment with thyroxine

(I). The action of (I) is counteracted by administration of vitamin-*A*. The metamorphosis of salamander larvæ induced by administration of (I) is retarded by administration of -*A*. The acceleration by carotene of the oxidation of unsaturated fatty acid is counteracted by (I). NUTR. ABS. (*m*)

Antagonism between carotene and the hormone of the thyroid gland. M. L. ROCHLINA (Bull. Biol. Méd. exp. U.R.S.S., 1936, **2**, 219—220).—Addition of carotene (I) to H_2O in which axolotls are developing delays metamorphosis but induces large increases in wt. Dried thyroid hastens metamorphosis but produces no increase in wt. In the presence of (I) and thyroid hormone there is no delay in metamorphosis and some increase in wt., but not as much as in the larvæ receiving (I) only. NUTR. ABS. (*m*)

Action of Lugol's iodine solution on the thyroxinised heart. R. K. PAL (Indian J. Med. Res., 1936, **23**, 957—962).—Lugol's I abolishes the toxic effect of thyroxine on the frog's heart; the KI of the solution is not responsible for the effect. R. N. C.

Molecular formula of thyroglobulin. G. SANKARAN and M. PATNAIK (Indian J. Med. Res., 1935, **23**, 223—227).—Analytical results are given for purified thyroglobulin. The empirical formula is $C_{415}H_{660}O_{134}N_{114}S_2K_2P_3I$. R. N. C.

Preparation of a purified thyrotropic hormone by chemical precipitation. C. G. LAMBIE and V. M. TRIKOJUS (Biochem. J., 1937, **31**, 843—847).—In the method described for the rapid recovery of the thyrotropic hormone of the anterior lobe of ox pituitary glands, most of the protein is removed by salicylsulphonic acid, concn. by evaporation is eliminated, the use of org. solvents reduced to a min., and the hormone is finally pptd. with BzOH in EtOH. The product is readily sol. in H_2O and is active in guinea-pigs in doses of 0·1 mg. The behaviour of the hormone to heat is examined. P. W. C.

Effect of thyrotropic hormone and successive administration of thyroxine and thyrotropic hormone on the metabolism of the guinea-pig. J. MAHAUX (Compt. rend. Soc. Biol., 1937, **125**, 379—382).—Previous injection of a large dose of thyroxine inhibits the effect of thyrotropic hormone on the metabolism. H. G. R.

Effect of thyroxine on the storage of protein in the liver. G. SCHÖNHOLZER (Beitr. path. Anat., 1936, **97**, 526—544).—In rats feeding of casein increases deposition of protein (I) in the liver. Treatment with thyroxine causes first the disappearance of glycogen from the liver, and then of (I). If treatment with thyroxine precedes feeding with (I) no deposits are produced. NUTR. ABS. (*m*)

Metabolism and importance of iodine in the young organism. III. Vitamins and blood-iodine. C. FIORI (Riv. Clin. pediat., 1936, **34**, 889—932).—In the blood of pigeons on a diet deficient in the antiberiberi vitamin, and of rabbits deprived of the antirachitic vitamin, there is an increase of I content, but in guinea-pigs deprived of vitamin-*C* there is a slight diminution. NUTR. ABS. (*m*)

Relation between vitamins and growth and survival of goldfish in homotypically conditioned water. G. EVANS (J. Exp. Zoöl., 1936, **74**, 449—476).—Appreciably increased growth results from keeping goldfish in H_2O "conditioned" by keeping other goldfish in it, but no improvement follows when the synthetic, vitamin-free diet of the fish is supplemented with lemon juice, yeast, and halibut-liver oil. The conditioned H_2O contains little or no vitamin-*B* complex or fat-sol. vitamins. NUTR. ABS. (*m*)

Accuracy of biological determinations of the vitamins. K. H. COWARD (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 39—47; cf. A., 1936, 1566).—The importance of variation in response of different animals to the same dose of vitamin is stressed. The variation in the response of animals of different litters is even > the response of individuals. Evidence of fluctuations in the average response of a whole stock of animals over a long period of time shows that it is essential that the standard of reference should always be tested with the vitamin source of unknown potency. Statistical methods for calculating the accuracy of vitamin-*D* determinations are given. W. L. D.

Interpretation of vitamin experiments. A. JUNG (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 70).—Plotting of experimental data and statistical treatment afford a simple method of estimating probable error and average response to different levels of vitamin feeding. W. L. D.

Complementary action of the vitamins. Interrelation of the vitamins and the effect of minerals and endocrine glands. G. DUBOIS (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 79—88).—In vitamin assays and in general nutrition, the effect of various factors such as the levels of each vitamin fed, the balance of minerals (Fe, Cu, Mn, Br, I), and the proper functioning of hormones is stressed. The importance of various enzymes necessary for the proper action of the vitamins is discussed. W. L. D.

Vitamin standardisation. H. CHICK (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 89—91).—The various standards of -*A*, -B_1, -*C*, and -*D* in present use are described and the principles of biological standardisation are discussed. W. L. D.

Vitamin science. A. L. BACHARACH (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 92—99).—International standard vitamin preps. are described. The different antirachitic effects of calciferol and -D_3 are discussed and the isolation and synthesis of other vitamins or concentrates are described. The chemical tests for the various vitamins are given. W. L. D.

Metabolism of carotene. H. E. C. WILSON, B. AHMAD, and B. N. MAJUMDAR (Indian J. Med. Res., 1936, **24**, 399—409).—In rats depleted of vitamin-*A*, absorption is most efficient when the carotene (I) is given as green vegetable. (I) is better absorbed from oil than from aq. suspension, but addition to the diet of 5% of ox bile or 10% of meat appears to improve absorption from aq. suspension. Addition

of 10% of fat to the diet makes little difference. When an aq. suspension of (I) is injected intraperitoneally into depleted rats there is considerable absorption by the peritoneal tissues, but eventually -*A* appears to be produced in the liver. Injection of (I) suspended in isotonic glucose solution into the ear veins of depleted rabbits leads to immediate fæcal excretion of yellow pigment. (I) is absorbed unchanged by the liver, and to a smaller extent by the spleen and lungs, from which it slowly disappears. Single injections of up to 2·5 mg. of (I) do not cause the appearance of -*A* in the liver, but positive results are obtained after 6 injections, amounting to 3·7 mg., given over a period of 3 weeks. Nutr. Abs. (*m*)

Chromatographic determination of provitamin-*A*. L. Zechmeister (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 20—21).—Many forms of the provitamin exist and their separation from vegetable and animal tissue is described. The Tswett chromatographic determination is given. W. L. D.

Rôle of vitamin-*A* in synthesis of the male sex hormone. B. Kudrjashev (Bull. Biol. Méd. exp. U.R.S.S., 1936, **1**, 406—407).—The injection of prolan into vitamin-*A*-deficient male rats restores the function of the seminal vesicles and prostrate even while the vitamin deficiency persists. Nutr. Abs. (*m*)

Lucerne leaf meal as a source of vitamin-*A* for growing chickens. B. W. Heywang and H. W. Titus (J. Agric. Res., 1937, **54**, 559—569).—Variation in vitamin-*A* potency of lucerne meals is as great within a particular type as between different types. To ensure a suitable supply of -*A* for chickens ≮5% of meals of unknown potency should be included in the ration. Large animals probably require a higher % of dietary -*A* than do small animals. A. G. P.

Carotene and vitamin-*A* requirements of children. W. R. Aykroyd and B. G. Krishnan (Indian J. Med. Res., 1936, **23**, 741—745).—Children on camp diets containing up to 454×10^{-6} g. of carotene at ages <5 years, 709×10^{-6} at 5—8 years, and 785×10^{-6} g. at >8 years showed symptoms of vitamin-*A* deficiency. R. N. C.

Vitamin-*A* of fish-liver oils. I. Abnormal Carr–Price reaction.—See B., 1937, 697.

Crystalline esters of vitamin-*A*. S. Hamano (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, **32**, 44—49).—The ester $C_{35}H_{36}O_4$ (I) (not $C_{35}H_{36}O_2$; cf. A., 1935, 1545) from the liver oil of *Theragra chalcogramma* and anthraquinone-2-carboxyl chloride is shown to be an ester of vitamin-*A* by conversion into the β-naphthoate. (I), which is also obtained from the liver oils of *Stereolepis ischinagi*, *Sebastodes flammeus*, and *Thynnus alalunga*, also affords a cryst. *isomeride*, m.p. 118°. Vitamin-*A* palmitate is shown to be a constituent of *T. chalcogramma* and *Sebastodes matsubarae* by isolation of its bis-maleic anhydride adduct (cf. A., 1935, 543) for which a formula is proposed. F. R. G.

Hydrogenation of the vitamin-*A* fraction of the liver oil of *Stereolepis ischinagi* (Hilgendorf). II. Z. Nakamiya (Bull. Inst. Phys. Chem. Res. Japan, 1937, **16**, 343—353).—The vitamin-*A* fraction with H_2–Pt oxide in AcOH yields an oil, of which the fraction, b.p. 136—138°/vac., when brominated and treated with $CHNa(CO_2Et)_2$ affords a dicarboxylic acid [converted by heat into a monocarboxylic acid and then a ketone (*semicarbazone*, m.p. 35°, different from Karrer's semicarbazone, m.p. 69°)], a *hydrocarbon*, $C_{18}H_{36}$, b.p. 108° [also formed when the above bromide is reduced (Zn–AcOH)], and an *alcohol*, $C_{18}H_{36}O$, b.p. 140°. J. L. D.

Studies in the synthesis of vitamin-*A*. III.—See A., II, 342.

Biological assay of vitamin-*A* in the diet of Indians. E. Surie (Indian J. Med. Res., 1936, **23**, 763—775). R. N. C.

Iodometric determination of vitamin-*A*. V. Soljanikova-Nikolskaja (Bull. Biol. Méd. exp. U.R.S.S., 1936, **1**, 410—411).—Conc. colloidal aq. solution of vitamin-*A* is titrated with 0·01*N*-I and the -*A* content is calc. on the assumption that 8 I are equiv. to 1 mol. of -*A*. Optimal results are obtained when I and -*A* are in contact for 20—40 min. The results agree fairly well with those of the colorimetric method. Nutr. Abs. (*m*)

Determination of vitamin-*A*. I. K. Murri (Lenin Acad. Agric. Sci., Inst. Plant Indust. Bull. Appl. Botany Ser. 3, No. 8, 1935, 27—44).—A modification of the method of Deleano and Dick for determining carotene (I) in plant materials is described. Results of chemical and biological determinations of the (I) content of fruits, vegetables, and berries agree well. Nutr. Abs. (*m*)

Determination of vitamin-*A*. A. Chevallier (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 36—38).—Concns. of vitamin-*A* solutions are calc. from the absorption in the region λ 3250—3280 with inspection of the general absorption in λ 2900—3600. A rapid method so that -*A* is not destroyed by ultra-violet light is advisable. Biological and $SbCl_3$ methods are discussed. W. L. D.

Spectroscopic determination of vitamin-*A*. R. A. Morton (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 58—67).—Vitamin-*A* and its precursors are discussed. Methods of determination depending on the intensity of absorption at λ 2800—3600 (max. 3280), and absorption of blue colour with the $SbCl_3$ reagent at λ 6050 and λ 5720, are described. The differences in results for oils and their unsaponifiable fractions are discussed and experiences with -*A* standards and types of cod-liver oil are reported. W. L. D.

Vitamin-*A* activity and ultra-violet light: spectrophotometric method of assaying vitamin-*A* and carotene. N. K. De (Indian J. Med. Res., 1935, **23**, 505—514).—Irradiation of cod-liver oil causes the band at 328 mμ to disappear slowly, whilst in solutions of carotene (I) the band at 463 mμ disappears. Vitamin-*A* is destroyed more rapidly than (I), and its sp. band is not produced by irradiation of (I), showing that ultra-violet light does not transform (I) into -*A*. (I) and -*A* are determined

spectrophotometrically by measurement of the changes produced by irradiation in the absorption coeffs. at 463 and 328 mμ respectively. R. N. C.

Effect of vitamins-*A* and -*D* on the plasma content of circulating blood. R. Tislowitz and J. Kurowski (Biochem. Z., 1937, **291**, 73—75).—In dogs oral administration of small or moderate doses of vitamin-*A* causes diminution of the plasma content of the blood, but if the administration is prolonged or if large doses are given the content is increased. Administration of vitamin-*D* increases the content. The erythrocyte content of the blood is diminished by giving -*A* and -*D*. W. McC.

Contribution of vitamin-B_1 to the metabolism of brain. R. A. Peters (Chem. Weekblad, 1937, **34**, 442—448).—A lecture.

Fermentation test for vitamin-B_1. A. Schultz, L. Atkin, and C. N. Frey (J. Amer. Chem. Soc., 1937, **59**, 948—949).—10^{-6} g. of natural or synthetic vitamin-B_1 can be detected by its acceleration of the buffered fermentation of glucose by Fleischmann yeast. The action can be used to determine the vitamin and gives results agreeing with those of rat growth tests. R. S. C.

Vegetative culture test for vitamin-B_1. Methods, criticism, and results. W. H. Schopfer and A. Jung (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 22—34).—The growth of *Phycomyces* is sensitive to -B_1 (1 unit of growth = 5×10^{-9} g. of -B_1) and the application of this principle for assay of the vitamin is described. Comparative experiments with the rat show good agreement for cryst. vitamin preps., yeast extracts, wheat germ, malt extracts, and rice polishings. Other conditions connected with the composition of the medium are discussed. W. L. D.

Rat experiments on determination of vitamin-B_1. Stability of international -B_1 standards. A. Scheunert and M. Schieblich (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 13—19).—The determination is based on the survival of $\leqslant 8$ rats for 35 days and losing $\geqslant 2$ g. in wt. The stability of the international standard is proved by the fact that 6 and 7 mg. were required during 1934 and 1935 respectively. W. L. D.

Determination of vitamin-B_1. R. A. Peters (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 35).—The val. of the curative pigeon test, the catatorulin test, the CH_2O–azo-reaction, and Schopfer's *Phycomyces* test is discussed. W. L. D.

Determination of vitamin-B_1 by the bradycardia method. L. J. Harris (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 100—111).—The increase in rate of heart-beat of B_1-avitaminised rats $\propto$ -B_1 content of the supplement. The method has the advantage of rapidity, convenience, and ease of determination of small amounts and avoids complications due to refection. The error of experiment is $<9\%$. Uses of the method are enumerated and the -B_1 contents of various agricultural products are given. W. L. D.

Constitution of oryzanin.—See A., II, 354.

Synthesis of vitamin-B_1.—See A., II, 354.

Heart rate in vitamin-B_1 and -*C* deficiency. G. Sankaran and B. G. Krishnan (Indian J. Med. Res., 1936, **23**, 747—754).—Vitamin-B_1 deficiency causes bradycardia in pigeons and a fall in the heart rate of rats, which is abolished by administration of -B_1. -*C* deficiency causes tachycardia in guinea-pigs. R. N. C.

Effect of vitamin-B_1 and -*C* on the persistence of Congo-red in the blood stream. R. Tislowitz (Biochem. Z., 1937, **291**, 70—72).—The rate of disappearance from the blood stream of the dog of injected Congo-red is decreased by administration of vitamin-B_1 and -*C* possibly because these diminish the permeability of the walls of the vessels. W. McC.

Changes in the content of vitamin-B_1 and -*C* in germinating cereal grains. A. von Kuthy (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 119—126).—By chemical tests it was found that -*C* increased, but -B_1 decreased, during germination. Germination at 15° produces more vitamin but the vitamin loss at 10° was small. Drying of germinated material decreased the -*C* but increased the -B_1 content. The effect of this on animal feeding is discussed. W. L. D.

Biological assays for flavin and dermatitis factors. C. A. Cook, M. F. Clarke, and A. E. Light (Science, 1937, **85**, 503—504).—Methods for the assay of flavin and other factors in the vitamin-B_2 complex using rats are described. L. S. T.

Chemical determination of flavin in urine, liver, and milk. A. Emmerie (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 57).—The determination of the yellow colour after removal of other pigments is the most reliable method. PbS is used as adsorbent from urine, and after elution and oxidation in AcOH with $KMnO_4$ and H_2O_2, the yellow colour is measured in a step photometer. With liver, oxidation is sufficient and adsorption is unnecessary. With milk, the MeOH–AcOH serum is conc., oxidised with $KMnO_4$–H_2O_2, and the colour measured. All manipulations are carried out in diffuse daylight or red light. W. L. D.

Cane molasses *versus* beet molasses as a source of vitamin-B_6 and lactoflavin. P. György (Proc. Soc. Exp. Biol. Med., 1937, **36**, 167—169).—Crude cane but not beet molasses is a good source of vitamin-B_6 and contains small amounts of lactoflavin. W. O. K.

Vitamin-*C* and antithyroidic action. A. Schäfer (Klin. Woch., 1936, **15**, 406—407; Chem. Zentr., 1936, i, 3534).—Vitamin-*C* exerts no antithyroidic action and has no influence on the functional condition of the thyroid. A. G. P.

Production *in vitro* of vitamin-*C* by surviving tissue. F. Widenbauer and K. Koschorrek (Biochem. Z., 1937, **291**, 209—215).—Slices of surviving small intestine (but not of other parts) of rats and mice (but not of guinea-pigs) in presence of PhMe produce vitamin-*C* from added glucose. W. McC.

Effect of vitamin-*C* on the composition of blood. Z. Aszódi (Biochem. Z., 1937, **291**, 34—50).—The erythrocyte content of the blood of guinea-pigs is independent of age but the hæmoglobin and leucocyte contents are lower in the young than in the old. Administration of excess of vitamin-*C* increases the erythrocyte and decreases the leucocyte content. Scurvy and administration of thyroxine cause first an increase, then a decrease in the erythrocyte content and scurvy, when severe, increases in the leucocyte content. Scurvy is probably a form of hyperthyroidism. W. McC.

Experimental vitamin deficiency and agents which raise basal metabolism. I. Gaseous metabolism of animals after various periods on scorbutic diet, at body and low temperatures. II. Inhibition of the rise in basal metabolism caused by 2 : 4-dinitrophenol in animals in an advanced state of scurvy. C. Ardy and L. Bellini (Riv. Patol. sper., 1936, **6**, 139—149, 151—155).—I. The O_2 consumption of guinea-pigs receiving Bezssonoff's scorbutic diet first increases and then decreases at 29°. At approx. 15° the intermediate rise is not observed.

II. Dinitrophenol injected into guinea-pigs, which have received a scorbutic diet for approx. 3 weeks, causes no increase in O_2 consumption at 28—30°. Nutr. Abs. (*m*)

Relations between *l*-ascorbic acid and intermediary gas metabolism. W. Klodt (Z. ges. exp. Med., 1936, **99**, 738—744).—The concn. of reduced ascorbic acid (I) in the venous blood is > in the arterial blood in normal rabbits and in rabbits which have received intravenous injections of (I). After muscular exercise, the reduction of oxidised (I) is increased. Inspiration of pure O_2 does not affect the equilibrium between the two forms, but during suffocation the balance is rapidly upset in favour of reduced (I). Hence (I) acts as an intermediary in the gas metabolism of cells. Nutr. Abs. (*m*)

Variations in glutathione and ascorbic acid in [guinea-pig's] liver. M. Loeper, J. Cottet, and G. Escallier (Compt. rend. Soc. Biol., 1937, **125**, 502—504).—On a scorbutic diet, parallel variations were observed between glutathione (I) and ascorbic acid (II). (I) but not (II) is increased by injection of cysteine. H. G. R.

Importance of ascorbic acid for the metabolism of the lens. A. Bakker (von Graefe's Arch. Ophthalmol., 1936, **136**, 166—171).—Ascorbic acid (I) diffuses into or out of the lens with equal ease. The lens cannot synthesise (I). The transparency of the lens is not dependent on its (I) content, and a normal rate of respiration is possible in a lens deficient in (I). Nutr. Abs. (*m*)

Histochemistry. X. Distribution of vitamin-*C* in the lens. D. Glick and G. R. Biskind (Arch. Ophthalmol., 1936, **16**, 990—995).—In the lens of the cow's eye there is very little variation in vitamin-*C* content from the periphery to the edge of the nucleus, but a slightly lower content in the nucleus. Nutr. Abs. (*m*)

Vitamin-*C* and blood. I. Action of blood on ascorbic acid. A. Francaviglia and F. De Ritis (Riv. Patol. sper., 1936, **6**, 157—173).—In blood, destruction of ascorbic acid (I) is associated with the breakdown of the corpuscles and is not due to the oxidising action of oxyhæmoglobin. (I) is not present in the reversibly oxidised form. Nutr. Abs. (*m*)

Effect of ascorbic acid on the oxygen dissociation of the blood and on biological oxidation. W. Klodt (Klin. Woch., 1936, **15**, 1637—1639).—The amounts of oxidised ascorbic acid (I) and dehydroascorbic acid in blood depend on its O_2 content. (I) appears to act as an intermediary in biological oxidation and dehydrogenation. Nutr. Abs. (*m*)

Vitamin-*C* in urine and blood. E. Gabbe (Klin. Woch., 1936, **15**, 292—296; Chem. Zentr., 1936, i, 3358; cf. A., 1935, 547).—Determinations by the Martini and Bonsignore method (A., 1934, 1271) show urine to contain the oxidised, reduced, and normal forms of -*C*. Ascorbic acid (I) is oxidised *in vitro*. The oxidising agent is present in blood corpuscles, especially after hæmolysis, but not in plasma. Elimination of large amounts of -*C* following repeated daily administration of 300 mg. of (I) is accompanied by marked diminution of the oxidising capacity of blood and urine. A. G. P.

Effect of avitaminosis-*C* on the carbohydrate metabolism of guinea-pig muscle. R. Duffau (Compt. rend. Soc. Biol., 1937, **125**, 436—439).—An increase in lactic acid and a disturbance in the P metabolism of muscle were observed in scurvy. H. G. R.

Presence of vitamin-*C* in certain substances in plants. H. N. Banerjee (Trans. Bose Res. Inst. Calcutta, 1934—1935, **10**, 145—170).—The ascorbic acid (I) concn. in the juices of date, palmyra, and coconut palms, and of palm-juice preps. is determined by the 2 : 6-dichlorophenol-indophenol method. (I) in these juices is extremely stable and the presence of a thermo-labile protective agent in coconut H_2O is established. The antiscorbutic activity of the coconut fruit is determined in guinea-pigs. A mannose dehydrogenase occurs in the juices. The transference of (I) from H_2O to kernel to embryo via the follicle is investigated. Green coconut fibre destroys (I). The stability of (I) in coconut H_2O is contrasted with its instability in the juice of *Citrus decumana*. P. W. C.

Vitamin-*C* in vegetables. VII. Lima beans. D. K. Tressler, G. L. Mack, R. R. Jenkins, and C. G. King (Food Res., 1937, **2**, 175—181).—The -*C* content of 8 varieties of lima bean varies with size of bean and habit of the plant. -*C* is lost during storage, to a greater extent in the shelled beans and to a smaller extent when refrigerated. The 33% loss which occurs as a result of blanching is materially reduced by shortening the blanching time by one half. E. C. S.

Antiscorbutic activity of the cabbage. M. Podzimková-Rieglová (Trav. Inst. Hyg. pub. Tchécoslov., 1936, **7**, 106—114).—The min. daily doses required to protect guinea-pigs from scurvy were: fresh cabbage 5 g., pickled cabbage 20 g., cooked pickled cabbage 40 g. Nutr. Abs. (*m*)

Content of vitamin-*C* in different varieties of potatoes (Holland). J. B. H. IJDO (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 127—131).—Different varieties show 60% and tubers of one variety 10% variation in -*C* content. Place of origin causes a difference, one variety showing 40%. Small and large tubers have the same content and the vitamin is distributed uniformly throughout the body of the tuber. All the -*C* is in the form of reduced ascorbic acid. W. L. D.

Antiscorbutic activity of dried fruits of the dog rose. N. SCHEPILEVSKAJA (Problems of Nutrition, Moscow, 1936, 5, No. 5, 9—12).—$\lessgtr$0·05 g. daily of the dried fruits protects guinea-pigs from scurvy. NUTR. ABS. (*m*)

Antiscorbutic activity of dried rose hips. Antiscorbutic properties of pine needles. VIII. Determination of vitamin-*C* in pine needle concentrates. N. SCHEPILEVSKAJA (Problems of Nutrition, Moscow, 1936, 5, No. 6, 73—80, 81—84).—The min. curative and prophylactic dose of dried rose hips is approx. 25—50 mg. daily.

VIII. The curative dose of pine needle concentrate for guinea-pigs is $<$ the prophylactic dose. NUTR. ABS. (*m*)

Determination of vitamin-*C* by titration. L. J. HARRIS (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 112—118).—Titration with 2 : 6-dichlorophenol-indophenol in acid solution after extraction with $CCl_3{\cdot}CO_2H$ gives reliable results. Manufactured products containing heated sugars (reductones) give too high vals. Compounds containing SH groups do not interfere in practice. Various uses of the test are described. The addition of HPO_3 protects against oxidation. W. L. D.

Determination of vitamin-*C*. V. N. BUKIN (Lenin Acad. Agric. Sci., Inst. Plant Ind. Bull. Appl. Botany, Ser. 3, No. 8, 1935, 5—26).—A modification of the method of Emmerie and van Eekelen (cf. A., 1936, 1159) is suggested, omitting $CCl_3{\cdot}CO_2H$ and using a mixture of 2% HCl and 5% aq. $HgCl_2$, in making extracts of plant materials. Materials containing reducing substances other than *l*-ascorbic acid, when treated in this way, give results in harmony with biological vals. NUTR. ABS. (*m*)

Determination of ascorbic acid in serum by the methylene-blue reaction. E. TRIER (Ugeskr. Læger, 1936, **98**, 1238—1241).—Determinations by the method of Lund and Lieck using sera from persons on a diet probably relatively rich in vitamin-*C* gave vals. of 0·15—1·4 mg. per 100 ml. (average 0·4 mg.); 60% of the vals. lay between 0·3 and 0·45 mg. Administration of 1 mg. of -*C* per kg. of body-wt. increased the vals., the increases being greatest where the fasting vals. were highest. There was a general correlation between fasting val. and habitual -*C* intake. NUTR. ABS. (*m*)

Determination of total ascorbic acid with methylene-blue. C. MENTZER (Compt. rend. Soc. Biol., 1937, **125**, 330—333).—Total ascorbic acid is determined with methylene-blue after reduction of dehydroascorbic acid by H_2S at p_H 6·5. H. G. R.

Reduced ascorbic acid. Determination by the methylene-blue method. C. MENTZER and A. VIALARD-GOUDOU (Bull. Soc. Chim. biol., 1937, **19**, 707—719).—The reducing val. of tissue can be determined in $CCl_3{\cdot}CO_2H$ extracts in terms of reduction of methylene-blue or exposure to an intense source of light (300-watt lamp) in presence of $Na_2S_2O_4$, at p_H approx. 5·8 and $\gtrsim$20°. The method is more sp. than the 2 : 6-dichlorophenol-indophenol method, cystine and glutathione having no effect under the conditions used. P. W. C.

Biological activity of *iso*vitamin-*C*. L. DE CARO and E. ROVIDA (Quad. Nutrizione, 1936, **3**, 465—467).—The effects on the adrenals of scorbutic guinea-pigs of daily injections of 50 mg. of vitamin-*C* or of *iso*vitamin-*C* (I) fail to show with certainty whether the antiscorbutic activity of (I) is due to (I) or to -*C* derived from (I). NUTR. ABS. (*m*)

Influence of feeding vitamin-*D* on frog's larvæ. J. ŠTEFL (Arch. exp. Path. Pharm., 1937, **185**, 81—84).—Characteristic areas of calcification appeared on the cartilagenous tail fin on feeding large doses of vitamin-*D* to larvæ of *Rana fusca* but no toxic symptoms appeared. P. W. C.

Calcium and vitamin therapy. G. PFEIFFER (Z. Kinderheilk., 1936, **58**, 515—522).—Ca is better absorbed and assimilated as citrate or glycerophosphate than as $Ca_3(PO_4)_2$ or $CaCO_3$. Administration in combination with vitamin-*D* increases absorption and storage of Ca, animals being more lively, with better coats, growth, and bone formation, than when fed on Ca alone. NUTR. ABS. (*m*)

Properties of calciferol. F. W. ANDERSON, A. L. BACHARACH, and E. L. SMITH (Analyst, 1937, **62**, 430—440; cf. A., 1933, 542).—73 samples of calciferol (I), manufactured under carefully controlled and highly standardised conditions, had m.p. 116° (±1°), $[\alpha]_{5461}^{20}$ +123·25—125·75° in EtOH (4% wt./vol.), $E_{1\,cm.}^{1\%}$ 265 mμ 460—500; these vals. are proposed as a revised specification for pure (I), that of the B.P. Addendum 1936 being considered unnecessarily wide. The biological activity of 11 blends varied from 35·7 to 45·0 (weighted mean 40·8) international units per 10^{-6} g. E. C. S.

Determination of vitamin-*D* using chickens and the relation of rat- to chicken-activity for different irradiated provitamins. J. VAN NIERKERK, A. G. BOER, E. H. REERINK, and A. VAN WIJK (Proc. 5th Intern. Cong. Tech. Chem. Agric. Ind., Holland, 1937, I, 68—69).—Radiographic and bone ash determinations after 4 weeks' feeding at different vitamin levels to chickens with simultaneous control with standard cod-liver oil were used. Sterol preps. from various sources showed a rat/chicken relation similar to that given by cod-liver oil and the method of assay has been used to follow the separation and concn. of *D*-provitamins from plant and other sources. W. L. D.

Crystalline vitamin-D_4. A. WINDAUS and G. TRAUTMANN (Z. physiol. Chem., 1937, **247**, 185—188).—22 : 23-Dihydroergosterol (I) is irradiated, unchanged (I) separated as digitonide, and the adduct of 22 : 23-dihydrotachysterol with citraconic anhydride

formed. Following saponification with MeOH–KOH, extraction with light petroleum–Et_2O affords an oil which with C_5H_5N and 3 : 5-$C_6H_3(NO_2)_2$·COCl yields the 3 : 5-*dinitrobenzoate*, m.p. 135—136° (uncorr.), $[\alpha]_D^{18}$ +94·5° in $COMe_2$, hydrolysed to *vitamin*-D_4, m.p. 107—108°, $[\alpha]_D^{18}$ +89·3° in $COMe_2$, with absorption spectrum max. (as with -D_2) at 265 mμ. F. O. H.

Concentration and properties of vitamin-*H*. L. E. Booher (J. Biol. Chem., 1937, **119**, 223—231).—Vitamin-*H* is defined as the residuum of the -*B*-complex, other than -B_1 and flavin, essential for growth in rats. Details are given of its 30-fold concn. from whey powder and a 60—90-fold concn. from rice polishings, with complete separation from -B_1 and flavin. R. M. M. O.

Vitamin-*P*. S. S. Zilva (Biochem. J., 1937, **31**, 915—919).—Administration of a daily dose of the flavonol glucoside "citrin" (I) or of 0·66 mg. of hesperidin (II) + 0·33 mg. of eriodictyol or of 1 mg. of purified (II) did not delay the onset of scurvy in guinea pigs. The administration of a daily dose of 0·1—0·2 mg. of ascorbic acid (doses < the min. prophylactic dose) produced a pathological condition resembling that obtained by Szent-Györgyi (A., 1936, 1162) by administration of a daily dose of 1 mg. of (I) or (II) to animals on a scorbutic diet. P. W. C.

Significance of macromolecular chemistry in biology. H. Staudinger (Chem.-Ztg., 1937, **61**, 549).—The special properties of chromosomes may be due to their macromol. character. E. A. H. R.

Physiology of protoplasmic streaming in leaves of *Vallisneria spiralis*. H. Fitting (Ber. deut. bot. Ges., 1937, **55**, 255—261).—The influence of Na indolylacetate on protoplasmic streaming was > that of tryptophan but < that of histidine (I) and methylhistidine (II). The presence in leaf extracts of (I) and/or (II) with smaller proportions of less active NH_2-acids is indicated. A. G. P.

Changes of apparent ionic mobilities in protoplasm. II. Action of guaiacol as affected by p_H. W. J. V. Osterhout (J. Gen. Physiol., 1937, **20**, 685—693).—The p.d. across the protoplasm of *Valonia macrophysa* in sea-H_2O is −10 mv. Addition of 0·01*M*-guaiacol (I) causes this p.d. to become temporarily positive, and then to return to normal. Increase of p_H, and hence of (I) ions, causes only minor variations in this behaviour. Increase of p_H after regaining the normal val., however, causes much greater changes. This behaviour is contrasted with that of other anions, and possible explanations are advanced. F. A. A.

Adsorption of dyes on cell-walls and the influence of inorganic salts. F. Kersting (Ber. deut. bot. Ges., 1937, **55**, 329—337).—Cells of *Spirogyra*, *Elodea*, or *Trianea*, stained with methylene- or toluidine-blue or neutral-red, decolorise only in the cell wall on treatment with 0·1*M*-$CaCl_2$ and other salts at p_H 4·6—4·8; the dye remains in the cellular fluid. The rate of decolorisation increases with increasing valency and lyotropy of the cation of the salt. The phenomenon occurs with both dead and living cells. F. O. H.

Polarity of buffering power in the tissues of *Potamogeton densus*, L. L. Blum (Compt. rend. Soc. Biol., 1937, **125**, 322—324).—The p_H of the tissues is 6·00±0·12. The buffering power of the apical is > that of the distal portion. H. G. R.

Toxicity and antagonism of some anions in cultures of *Saprolegnia*. F. Moreau and (Mme.) F. Moreau (Compt. rend., 1937, **204**, 1356—1358; cf. this vol., 71).—Very small amounts of KCl, K_2SO_4, and KNO_3 accelerate the growth of *Achlya colorata*, Pringsh. Higher concns. retard or inhibit growth and the development of reproductive organs; NO_3' is least and SO_4'' most toxic. Cl', SO_4'', and NO_3' antagonise one another. J. L. D.

Kinetics of penetration. XIV. Penetration of iodide into *Valonia*. A. G. Jacques (J. Gen. Physiol., 1937, **20**, 737—766).—When NaI is added to sea-H_2O surrounding *Valonia*, I enters the cell. The amount entering as HI is negligible compared with that entering as NaI; HI thus differs markedly from H_2S (A., 1936, 531). The rate of passage of NaI through the protoplasmic layer is about 10^{-6} of that through H_2O. F. A. A.

Iron in the nutrition of higher plants. T. T. Demidenko (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 267—271).—Accumulation of Fe by oats and sunflower occurs mainly before flowering. Fe cannot be replaced by Zn, Mn, Al, Ni, Cd, or Zr. Mg pyrrole-2-carboxylate (cf. Oddo and Polacci, A., 1920, i, 407) applied to the roots, stems, or leaves cannot replace Fe. Colloidal Fe is not absorbed by roots or leaves. W. O. K.

Applicability of the Kjeldahl process to the determination of nitrogen in biological material. C. Olsen (Biochem. Z., 1937, **291**, 178—187).—Andersen and Jensen's modification (A., 1926, 375) of the Kjeldahl method gives trustworthy results but that of Smyth and Wilson (A., 1936, 121) gives results as much as 10% low partly because the time of heating is too short. Legumes do not utilise atm. N_2 in the absence of bacteria, Vita's results (A., 1933, 103) being based on an untrustworthy method of N determination. W. McC.

Influence of certain substances on changes in the nitrogen content of leguminous seeds during germination. N. Vita and R. Sandrinelli (G. Biol. ind. agrar. aliment., 1935, **5**, 41—51; Chem. Zentr., 1936, i, 3351).—Glucose and sucrose have no influence on the N-fixation of peas and lupins and may even retard the action of other stimulants. Distilled H_2O in May–June stimulates, and in other months retards, fixation. A. G. P.

Metabolism of amides in green plants. I. Amides of the tobacco leaf. H. B. Vickery, G. W. Pucher, A. J. Wakeman, and C. S. Leavenworth (J. Biol. Chem., 1937, **119**, 369—382).—Glutamine (I) and asparagine (II), in this order, are synthesised in daylight, but mainly (II) in the dark, when NH_3 also accumulates in the leaves. A non-N precursor of (II) is present in the leaves and a similar precursor of (I) is produced by photosynthesis. P. G. M.

Metabolism of purine-nitrogen in fungi. I. Distribution of allantoinase and uricase in

basidiomycetes. A. Brunel (Bull. Soc. Chim. biol., 1937, **19**, 747—756).—Allantoinase is present in many species of fungi, is very unevenly distributed in the organism, and is present to the greatest extent in young non-sporing fungi. Uricase, which is widely distributed in fungi, is very sp. in action, being ineffective with 1- and 7-methyluric acid. P. W. C.

Production of choline in rye-grass in relation to parasitism. J. Chaze (Compt. rend., 1937, **204**, 1443—1445).—In the presence of parasites, the caryopses and plantules of *Lolium temulentum* produce choline. E. M. W.

Formation of citric acid in the makhorka leaf (*Nicotiana rustica*, L.). O. J. Sobolevskaja and V. S. Butkevitsch (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 157—160).—Formation of citric acid in the leaf during drying occurs at the expense of carbohydrate, and is increased by vac. injection of glucose prior to drying. A. G. P.

Carotene metabolism of leaves during the whole vegetative cycle. N. T. Deleano and J. Dick (Biochem. Z., 1937, **290**, 360—363).—Storage of carotene (I) in leaves of willows (*Salix fragilis*) bearing male and female blooms continues for the first 70 days and the (I) content then remains const. until the end of the season. Fully developed leaves of trees bearing male blooms contain 25% more (I) than those of trees bearing female blooms. P. W. C.

Calculation of assimilation [of carbon dioxide by green leaves] by Boysen-Jensen's method. H. von Dücker (Biochem. Z., 1937, **291**, 188—190; cf. Planta, 1933, **21**, 368).—The formula for calculating the amount of CO_2 taken up by a green leaf from the atm. gives trustworthy vals. only when the val. for the normality of the HCl does not differ much from 0·045. Trustworthy vals. are obtained in all cases when the expression $2n/(L + A)$ is omitted. W. McC.

Effect of variation of temperature on the respiration of the flower of *Helianthus annuus*. A. G. Thakurta and B. K. Dutt (Trans. Bose Res. Inst. Calcutta, 1934—1935, **10**, 93—111).—Rise of temp. enhances respiration up to a max. of 52°, marked decline then occurring, followed by cessation and death of the organism at 55°. Seasonal variation has no affect on the crit. temp. max. The temp. coeff. of respiration is fairly const. over the range 32—52°, the optimum temp. for respiration being at 34°. P. W. C.

Respiration and assimilation of certain water mosses. S. Usami (Acta phytochim., 1937, **9**, 287—297).—Respiration of *Fontinalis*, *Chiloscyphus*, and *Riccia* is more marked in conductivity H_2O than in 0·04*M*-phosphate buffer. Slight increase is caused by glucose, galactose, and sucrose, AcOH and $Pr^{\alpha}CO_2H$ whereas fructose, hexosediphosphoric acid, HCO_2H, $EtCO_2H$, and $AcCO_2H$ are without influence and $H_2C_2O_4$ and $CH_2(CO_2H)_2$ are restrictive. KCN, alone or in presence of glucose, is somewhat inhibitory. Methylene-blue does not affect respiration, which is hindered by $NH_2{\cdot}CO_2Et$. Respiration is almost unchanged by 0·002*M*—0·001*M*-NH_2OH whereas assimilation is completely repressed at the latter concn. At similar concn. KCN has less influence than NH_2OH on assimilation. H. W.

Animal hormones and plants. H. Nicol (Chem. and Ind., 1937, 526—527).—A brief review. The term "plant hormone" applied to substances which do not occur naturally in plants is a misnomer. A. G. P.

Hormonal theory of plant development. II. M. C. Tschajlachjan and L. M. Jarkovaja (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 215—217; cf. this vol., 49).—In grafting experiments it is shown that the blossoming of the short-day plant *Helianthus tuberosus* may take place under the influence of hormone formed in the leaves of the long-day sunflower plant. The view is confirmed that blossoming plants represent a source of a blossom forming hormone or florigen and can be utilised as stock for accelerating the blossoming and fruit-bearing in both non-flowering annuals and perennials. P. W. C.

Photoperiodism and a hypothesis as to hormones of flowering. B. S. Moschkov (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 211—214).—Using species of *Nicotiana* which flower under conditions of a long day and other species, *e.g.*, *N. tabacum*, which flower only under conditions of a short day, and grafts of the two types, it is found that the flower-producing hormone is synthesised by leaves of mature plants, the leaves of the short- and long-day species synthesising the same hormone under their respective conditions. The substance is conveyed within the plant from cell to cell by osmotic processes. P. W. C.

Comparative effectiveness of acids, esters, and salts as growth substances: methods of evaluation. P. W. Zimmerman and A. E. Hitchcock (Contr. Boyce Thompson Inst., 1937, **8**, 337—350).—A specially purified sample of α-naphthylacetic acid (I) compared favourably with indolylacetic acid for inducing bending responses in plants, and was relatively much more active in effecting root initiation. Indolylbutyric acid and (I), and their K, Na, and NH_4 salts, were the most effective, among acids examined, in inducing rooting of cuttings. Salts were slightly less toxic than the corresponding acids and less inhibitory to growth of aërial roots of the tropical grape, *Cissus*. The acids were less active than their salts or esters in *Avena* tests. A. G. P.

Effect of the roots on the production of auxin by the coleoptile. J. van Overbeek (Proc. Nat. Acad. Sci., 1937, **23**, 272—276).—The production of auxin (I) by the coleoptiles of *Avena* seedlings is reduced by removal of the root system. This results in reduced growth but an increased sensitivity to (I). Plants from which both roots and seeds have been removed have a lower initial sensitivity, but as no regeneration of (I) takes place, the curvature goes on increasing. Such plants are specially suitable for the detection of small amounts of (I). W. O. K.

Correlation phenomena and hormones in *Selaginella*. S. Williams (Nature, 1937, **139**, 966).—Preliminary experiments indicate that the presence or absence of heteroauxin is an effective factor in

determining whether an angle-meristem shall develop as a rhizophore, leafless and positively geotropic, or as a plagiotropic leafy shoot. L. S. T.

Root production. O. Fischnich (Ber. deut. bot. Ges., 1937, **55**, 279—287).—Application of β-indolylacetic acid (I) or its Na salt to the mid-rib of *Coleus* leaves stimulates production of roots on the stem beneath. Darkening the leaf or cutting from margin to midrib prevents this action probably by restricting C assimilation and translocation. By placing stems of such darkened or damaged leaves in glucose solution root initiation by (I) is increased. A. G. P.

Growth phenomena in plants following injections of heteroauxin (β-indolylacetic acid). M. M. Janot (Compt. rend., 1937, **204**, 1358—1360).—Synthetic β-indolylacetic acid (0·01% solution) when injected into the conducting system of young shoots of *Polygonum cuspitadum* results in the bending of the shoot which lasts several weeks. The curvature always directs the shoot towards the light. J. L. D.

Growth-substances, root production, and cambial activity in woody cuttings. M. A. H. Tincker (Nature, 1937, **139**, 1104—1105).—Root formation in *Viburnum Carlesii* is stimulated by treatment of cuttings with dil. aq. solutions of α-naphthyl- (I) or β-indolyl-acetic acid before planting. Photomicrographs showing stimulation of the cambium to marked activity by (I) in cuttings of *Ceanothus dentatus* and *Myrthus communis* are reproduced. Natural seasonal excitation of the cambium may result from the downward translocation of similar growth-substances formed in young leaves. L. S. T.

Effect of heteroauxin on the growth of broad bean plants in water culture. H. L. Pearse (Nature, 1937, **140**, 26).—Heteroauxin (I) supplied to the culture solution in which seedlings of *Vicia faba* are grown retards growth in length of the roots, although the total root wt. remains practically unaltered. Spraying the shoots with (I) slightly decreases the wt. of root growth without altering its form. Shoot growth is retarded by both treatments, but only spraying induces swelling of the stem and epinasty of the leaves. The terminal bud is inhibited by spraying. L. S. T.

Skatole as a root-forming substance. L. G. G. Warne and A. A. Jackson (Nature, 1937, **140**, 26—27; cf. A., 1936, 532).—Treatment with a solution of skatole (20 mg. per 100 c.c.) accelerates root production in cuttings of *Leptospermum scoparium* and of *Ficus repens*. *l*-Tryptophan is inactive. L. S. T.

Growth-substance and germination of fruit-tree seeds. R. von Veh and H. Söding (Ber. deut. bot. Ges., 1937, **55**, 270—278).—Germination of apple seed is not necessarily accompanied by an increased content of growth-substance (I). The inhibitory action of the endosperm on germination is not attributable to its ability to inactivate (I) in the embryo. (I) does not act as a "germination hormone" in apple seeds. A. G. P.

Chemical examination of the Indian medicinal plant *Trichosanthes dioeca*. N. C. Nag (Trans. Bose Res. Inst. Calcutta, 1934—1935, **10**, 113—123).—Characteristic variations in the proportions of the mineral constituents occur in the various parts of the plant. The tuber has high K_2O and H_3PO_4 contents, the stem high CaO, K_2O, and Na_2O contents, the leaf a high SiO_2 and CaO content, and the fruit a high K_2O content, fairly high CaO and H_3PO_4 content, but only traces of SiO_2. The roots contain 0·9 and the leaves >4% of N. The type of soil suitable for the growth of this plant is examined. P. W. C.

Distribution of phosphorus in the starch granule. C. L. Alsberg (Proc. Soc. Exp. Biol. Med., 1937, **36**, 127—129).—Samples containing granules of different sizes, separated from a prep. of cassava starch, all contained approx. the same P_2O_5 content. There is no evidence that natural, ungelatinised starches possess an insol. membrane rich in P. W. O. K.

Species of the genus *Monarda*. III. Ash analyses. IV. Histology of *M. menthæfolia*, var. *leucantha*. B. V. Christensen and R. S. Justice (J. Amer. Pharm. Assoc., 1937, **26**, 466—469, 469—474; cf. B., 1937, 497).—III. Data for the ash constituents of different parts of various species are given. A correlation possibly exists between the inorg. (*e.g.*, Ca, SO_4'') and phenolic constituents. F. O. H.

Manganese in the ash of spruce trees. V. Adamek (Papier-Fabr., 1937, **35**, 230—231).—Up to about 22% of MnO_2 was found in the ash of spruce trees. The Mn content is paralleled by that of P_2O_5. Growing conditions (soil, geographical position, sunlight, etc.) appear to have no affect on the Mn content, which in itself is very heterogeneously distributed in the trunk. D. A. C.

***Chrysopsis graminifolia*, Nutt.** H. D. Roth and H. M. Burlage (J. Amer. Pharm. Assoc., 1937, **26**, 415—418).—The plant, H_2O 9·8—10·8, ash 6·26—8·33 (acid-insol. 0·67—4·65), contains N, P, saponins 0·36, reducing substances, and tannins 3·95%. F. O. H.

Biological rôle of hydroxylamine. VI. Presence of volatile compounds of hydroxylamine in fresh leaves of higher plants. M. Lemoigne, P. Monguillon, and R. Desveaux (Bull. Soc. Chim. biol., 1937, **19**, 671—674).—An error in the technique employed in an earlier paper (A., 1936, 532) is eliminated and the previous results are confirmed. P. W. C.

Localisation of pentosans in the resin glands of the cotton embryo. R. G. Reeves and J. O. Beasley (J. Agric. Res., 1937, **54**, 711—718).—Pentosans probably occur in the resin glands but not in any other part of the embryo. The specificity of tests applied is discussed and shown to be inapplicable to resin glands of leaves owing to interference by certain pigments. A. G. P.

Organic acids of the ripe banana. P. L. Harris and G. L. Poland (Food Res., 1937, **2**, 135—142).—All, or nearly all, of the non-volatile org. acid

of the ripe banana is *l*-malic acid (I). During ripening the % of (I) increases within the range 0·053—0·373, the titratable acidity increasing from 2·8 to 5·4 ml. of *N*-alkali per 100 g. of fruit. At the stage of ripeness at which it is usually eaten the % of (I) is 0·314 approx. From the stage when the peel is more yellow than green, the titratable acidity = the % of (I). E. C. S.

Chlorophyll deficiencies in sorghum ; xantha and patchy albino. G. N. R. Ayyangar and T. V. Reddy (Proc. Indian Acad. Sci., 1937, **5**, B, 183—185).—Two chlorophyll-deficient types are described. The xantha type contains chlorophyll 9·7 and xanthophyll 97·8% of the normal amounts. A. G. P.

Isolation of carotene from a wood oil. V. M. Trikojus and J. C. Drummond (Nature, 1937, **139**, 1105).—β-Carotene has been isolated by chromatographic fractionation on Al_2O_3 from the oil extracted from *Acacia acuminata* by light petroleum. L. S. T.

Membranes of spores and pollens. XI. Constitution of lycopodium sporonin, tasmanin, and Lange sporonin. F. Zetzsche, P. Kalt, J. Liechti, and E. Ziegler (J. pr. Chem., 1937, [ii], **148**, 267—286; cf. A., 1932, 784).—Sporopollenins from 5 extant and 3 fossil spores show 1·7—4·5 CMe per mol. (Kuhn–l'Orsa method). The products of ozonisation of lycopodium sporonin (I) and tasmanin (II) differ greatly in solubility. Those from (I) include malonic 1, glutaric 1, adipic 1, and succinic acid 2 mols. (calc. on a C_{90} mol.), and acids of equiv. wts. 93·2, 96·5 ($C_7H_{12}O_6$), and 112·1. Those from (II) include glutaric <1, adipic <1, and succinic acid 1·78 mols., and resin acids, $C_{30}H_{46}O_{14}$ and $C_{20}H_{30}O_9$. The distribution of *C*-Me in the fossil material is discussed. R. S. C.

New alcohol from oil of raspberries. H. Marcelet (Compt. rend., 1937, **204**, 1446).—An *alcohol*, $C_{19}H_{40}O$, m.p. 62·5° (*benzoate*, m.p. 45°; *acetate*, m.p. 58°; *phenylurethane*, m.p. 80°), has been isolated from the fatty matter of wild raspberries. E. M. W.

Bark of *Terminalia arjuna*, Bedd. II. Isolation of arjunetin from the alcohol extract. R. R. Agarwal and S. Dutt (Proc. Nat. Acad. Sci. India, 1936, **6**, 304—308).—The bark of *T. arjuna* contains besides arjunin (cf. A., 1936, 395) 0·25% of a lactone *arjunetin* (I), $C_{11}H_{18}O_4,H_2O$, m.p. 215°, and 1% of an amorphous red colouring matter, m.p. 132°. Saponification and acidification of (I) gives an isomeric *compound*, m.p. 165°. P. W. C.

Bark of *Aspidosperma quirandy*, Hassler. L. Floriani (Rev. centro estud. farm. bioquím., 1935, **25**, 373—394, 423—447).—In addition to the common extractives (resins, tannins, etc.) the bark contains a saponin (*quirandy saponin*), the alkaloids aspidospermine and aspidosamine, together with two new cryst. alkaloids *haslerine*, m.p. 237°, and *quirandine*, m.p. 218°, and other uncharacterised alkaloids. Toxicity data (rabbits) for the total alkaloidal extract are given. Ch. Abs. (*p*)

Determination of coumarin, melilotic acid, and coumaric acid in plant tissue. W. L. Roberts and K. P. Link (J. Biol. Chem., 1937, **119**, 269—281).—A colorimetric method for determining these constituents in sweet clover is based on extraction of the tissue with a solution containing $COMe_2$ + 0·1*N*-H_2SO_4 (1 : 9 by vol.), followed by separation of the constituents with suitable solvents and coupling with diazo-*p*-nitroaniline. P. G. M.

Coumarin content of *Melilotus dentata*. R. A. Brink and W. L. Roberts (Science, 1937, **86**, 41—42).—No coumarin (I), melilotic acid, or coumaric acid could be detected at the flowering stage in the vegative tissues of *M. dentata*, the non-bitter species of clover, from various places. Small amounts of (I) (0·021—0·074% on dry basis) are present in the seed. Comparative data for *M. officinalis* and *M. alba* are given. L. S. T.

Occurrence of rhapontizin in species of *Rheum* ; its identification in adulterations of rhubarb rhizomes. P. N. Schürhoff and G. Plettner (Arch. Pharm., 1937, **275**, 281—293).—Rhapontizin (I), being a dihydric methoxy-phenol, gives colours with several aldehydes in H_2SO_4–EtOH. The bluish-violet colour given by furfuraldehyde is used as a test for (I), either microscopically on the solid or on the aq. EtOH extract. Rhizomes of eleven species of *Rheum* are thus shown to contain (I), which, however, is absent from many others and from the official drug. Results are confirmed by the fluorescence test. Adulteration of *Rheum* drugs by other species can be thus detected. R. S. C.

Constitution of shonanic acid, one of the two characteristic volatile acids from the wood of *Libocedrus formosana*, Florin. II. Reduction and bromination of shonanic acid. III. Oxidation of shonanic acid. N. Ichikawa (Bull. Chem. Soc. Japan, 1937, **12**, 233—243, 243—252; cf. this vol., 108).—II. Shonanic acid (I) is not reduced by Na–Hg, but with C_5H_{11}·OH–Na (5 atoms) yields 75% of tetra- (II) and 25% of di-hydroshonanic acid (III), whilst with Na (20 atoms), (II) alone is produced. (III) may be reduced to (II) with C_5H_{11}·OH–Na (large excess). (I) yields an oily *dibromide* (IV), which absorbs no more Br, is reduced (Zn–AcOH) to (I), and on heating to 40—50°/40—50 mm. affords a *monobromolactone*, $C_{10}H_{13}O_2Br$, which with Br–AcOH gives a *tribromolactone*, m.p. 212°. Distillation of (IV) affords *p*-cuminic acid, and oxidation (aq. $KMnO_4$) an *acid*, $C_9H_{13}O_3Br$, m.p. 239° (decomp.).

III. Oxidation of (I) (aq. $KMnO_4$) affords $CMe_2(CO_2H)_2$ and HCO_2H; the acid chloride of (I) is reduced (Pd–$BaSO_4$–H_2) to an *aldehyde*, $C_{10}H_{18}O$, b.p. 73°/5 mm. (*semicarbazone*, m.p. 165°). Reduction of (I) or (II) with HI–P affords a *hydrocarbon* $C_{10}H_{20}$, b.p. 157—158·5°/754 mm., whilst (II) distilled with soda-lime yields an unsaturated *hydrocarbon*, C_9H_{16}, b.p. 144·5—145°/757 mm. (I) heated with HNO_3 yields *o*-$C_6H_4(NO_2)_2$. J. D. R.

Chemical characteristics of *Euphorbia lathyris*, L., as an oleaginous plant. N. F. Dublianskaja (Biochimia, 1937, **2**, 521—536).—The seeds contain 50%, and the kernels 70%, of a toxic oil, consisting of glycerides of oleic 64—87, saturated 8—20, and linoleic acid 4—17%, with 0·45—0·88%

of unsaponifiable lipins from which a *substance*, $C_{18}H_{35}O_7$, m.p. 199·7° ("euphorbiosteroid"), is isolated. The leaves and flowers of the plant contain 18% of resins and 0·15—0·26% of rubber-like substances. R. T.

Acorns of *Quercus rubra*. C. J. Monarca and E. V. Lynn (J. Amer. Pharm. Assoc., 1937, **26**, 493—495).—The kernels, H_2O 11·02, protein 4·41, starch 28·23, tannin 11·74%, yielded 11% of an oil, d^{25} 0·9141, n^{20} 1·4725, sap. val. 195·3, acid val. 4·5, I val. 100·1, Reichert–Meissl val. 1·1, Polenske val. 0·8, unsaponifiable content 0·9%. F. O. H.

New unsaturated fatty acid $C_{10}H_{18}O_2$ in the oil of *Rindera obtusiloda*. S. Komori and S. I. Ueno (Bull. Chem. Soc. Japan, 1937, **12**, 226).—From the unsaturated fatty acids of the saponified oil is isolated Δ^{γ}-*decenoic acid* (I), hydrogenated to decoic acid and oxidised ($KMnO_4$ in $COMe_2$) to succinic and hexoic acids. The name "obtusilic acid" is proposed for (I). J. D. R.

Species of *Monarda*. II. Alcoholic extractive and miscellaneous determinations. B. V. Christensen and R. S. Justice (J. Amer. Pharm. Assoc., 1937, **26**, 387—394; cf. B., 1937, 101).—The 95% EtOH extract of the leaves and flowers of *M. menthæfolia* yields a volatile oil, linoleic and oleic acid, thymoquinol (I), solid fatty acids, and two pigments, m.p. 216—218° and 204—205°, respectively. Somewhat similar substances, but not (I), are present in the extract of the entire plant of *M. punctata*, var. *leucantha*. The pentosan, crude fibre, and tannin contents of *M. menthæfolia* were determined. F. O. H.

Essential oils from the leaves of *Languas* (*Alpinia*) varieties. A. J. Ultée (Rec. trav. chim., 1937, **56**, 409—412; cf. this vol., 81).—The oils contain α- and β-pinene, cineole, camphor, borneol, and Me cinnamate. J. L. D.

Yield of essential oil by a new variety of dragonhead (*Dracocephalum Moldavica*, L., var. *hexagonum*, D. Vakulin) from different seed samples. D. J. Vakulin (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 203—205).—The yield of essential oil varies from 0·133 to 0·627% of the dry wt. The hexagonal-stemmed variety always gave a higher yield of oil than the common square-stemmed type both in full flower and at the stage of fading. P. W. C.

Oil from resin of *Pistacia terebinthus*. G. Tsatsas (J. Pharm. Chim., 1937, **25**, [viii], 595—599).—The fresh resin contains approx. 12% of oil which consists mainly of *d*-pinene, together with dipentene and small amounts of borneol and bornyl acetate. J. N. A.

***d*-Galacturonic acid from peels of Chinese pomelo.** P. P. T. Sah and H. Y. Fang (J. Chinese Chem. Soc., 1937, **5**, 107—115).—*d*-Galacturonic acid, isolated from peels of *Citrus hurantium*, var. *decumana*, by extraction with hot 60% EtOH, hydrolysis of the dried residue (100 g.), and pptn. as the Ba salt (30 g.), was characterised by the p-*tolylhydrazone* of its p-*tolylhydrazinium salt*, decomp. 122°, the corresponding phenylhydrazone, and its *oxanilhydrazone*, decomp. 212—214°. A. Li.

Determination of sugars in plants. W. Z. Hassid (Ind. Eng. Chem. [Anal.], 1937, **9**, 228—229).—The method previously described (A., 1936, 650) is modified by using Setopaline *C* as indicator and reducing the excess of alkaline ferricyanide. F. N. W.

Fucoidin. G. Lunde, E. Heen, and E. Öy (Z. physiol. Chem., 1937, **247**, 189—196).—Fucoidin, from the leaves of *Laminaria digitata*, is a carbohydrate sulphuric ester of the type $RO{\cdot}SO_2{\cdot}OR'$ where R consists of 60% of fucose and R′ is mainly Na, some K, and small amounts of Ca and Mg (cf. Bird and Haas, A., 1931, 776). F. O. H.

Araban of wheat flour. R. Geoffroy (Bull. Soc. Chim. biol., 1937, **19**, 60—64).—The araban, $[\alpha]_D$ approx. −50°, in wheat flour (cf. B., 1935, 121), isolated by fractional pptn. of aq. extracts by EtOH, is not hydrolysed by yeast (under baking conditions) and only slowly by warm dil. acids. F. O. H.

Levosin from wheat. H. Colin and H. Belval (Bull. Soc. Chim. biol., 1937, **19**, 65—68; cf. A., 1935, 1290).—White flour contains 0·6% of levosin (I), 0·2—0·3% of sucrose, and 0·1% of reducing sugars. Under baking conditions, (I) is slowly fermented, >50% being decomposed in 4 hr. F. O. H.

Differentiation of carbohydrate complexes on micro-analysis of plant materials. S. M. Strepkov (Biochem. Z., 1937, **290**, 378—381, and Z. anal. Chem., 1937, **108**, 406—408).—The apparatus described permits the micro-determination of 7 fractions of a carbohydrate complex, viz., material sol. in hot EtOH, sol. in cold H_2O but insol. in EtOH, sol. in warm H_2O, hydrolysable by diastase, sol. in hot H_2O, hydrolysable by 2% H_2SO_4, and not hydrolysable by dil. H_2SO_4. The method gave good results in determination of the constituents of a mixture of sucrose, erythrodextrin, inulin, potato starch, and cellulose. P. W. C.

Pectin compounds of cotton. M. M. Tschilikin and Z. S. Rozova (J. Appl. Chem. Russ., 1937, **10**, 709—716).—Cotton contains 0·46% of pectic acids, not extracted by H_2O at 40°, and only partially extracted at 100°. Complete extraction, with decomp. of pectins, is achieved by autoclaving, or with boiling aq. NaOH or $NaHCO_3$. The pectin yields galacturonic acid, arabinose, xylose, and fructose when hydrolysed. Pectins do not interfere with bleaching of cotton. R. T.

Fruits of *Physalis Peruviana* or Cape gooseberry. I. J. B. Lal (Proc. Nat. Acad. Sci. India, 1936, **6**, 309—313).—The juice of ripe berries of *P. Peruviana* contains large amounts of pectin and pectinase, 3—4% of free glucose, 13·2—17% of total glucose after hydrolysis, 2·6% of citric acid, malic and traces of tartaric acids, but no $H_2C_2O_4$, BzOH, or salicylic acid. P. W. C.

Identification of crystalline cellulose in young cotton fibres by *X*-ray diffraction analysis. W. A. Sisson (Contr. Boyce Thompson Inst., 1937, **8**, 389—400).—The cellulose (I) *X*-ray diagram in young cotton fibres is obscured by a cryst. "wax-

pattern" which is removed by $CHCl_3$, and by an amorphous diagram which is removed by treatment with 1% aq. NaOH and bleaching with 2% aq. NaOCl. The crystallographic identity of (I) from young purified fibres with that of mature (I) is established. (I) is first formed in the cytoplasm as cryst. (I) and, once formed, is not modified during growth. A. G. P.

Structure of cotton fibres in the dark [microscope] field. B. Rabinowitsch (Contr. Boyce Thompson Inst., 1937, 8, 401—403).—In young fibres cellulose (I) particles occur chiefly as uncombined units, which tend to form chains as growth proceeds. In the disintegration of mature fibres the breakdown of membrane layers into fibrils and thence into (I) particles is observed. A. G. P.

Distribution of saponins in plant drugs. M. Roberg (Ber. deut. bot. Ges., 1937, **55**, 299—309).—The qual. distribution of saponin in various parts of plants of pharmaceutical interest is tabulated. F. O. H.

Verbenaloside content of the cortex of roots of *Cornus florida*, L. Examination of the cortex of roots of *Cornus mas*, L., and *Cornus sanguinea*, L., for this heteroside. J. Cheymol (J. Pharm. Chim., 1937, [viii], **25**, 5—11; cf. A., 1937, II, 7; this vol., 161).—The identity of cornin from the root cortex (I) of *Cornus florida*, L., with verbenalin (II) (cf. A., 1935, 1041) is confirmed; the name *verbenaloside* is preferred for (II). The aërial parts of European vervain contain three times as much (II) as does (I). In the root cortex of *C. mas*, L., and *C. sanguinea*, L., (II) is not detected. E. W. W.

Drying of *Verbena officinalis*, L. Decrease in holosides and verbenaloside. Slight increase in sugars. J. Cheymol (J. Pharm. Chim., 1937, [viii], **25**, 581—586).—Air drying of the aërial parts of vervain slightly increased the amount of reducing sugars due to hydrolysis of holosides, which decreased by 18·9%; verbenaloside decreased by 28·7%. Roots contained larger amounts of sugars and in these the holosides and verbenaloside decreased by 3·3% and 9·5% respectively on drying. J. N. A.

Scoparin (scoparoside) from *Sarothamnus scoparius*, Koch. M. Mascré and R. Paris (Compt. rend., 1937, **204**, 1270—1271; cf. A., 1927, 248).—An improved method of isolating scoparin, $C_{22}H_{22}O_{11},2H_2O$, m.p. 230° (block), and many of its reactions are described. Enzymic hydrolysis affords a methylpentose and a flavin. J. L. D.

Occurrence and distribution of saponins in seed drugs. M. Roberg (Arch. Pharm., 1937, **275**, 328—336).—Saponins are shown by the blood–gelatin test to be present in the seeds of *Agrostemma*, *Albizzia*, *Chenopodium*, *Digitalis*, fenugreek, horse-chestnut, *Kaladana*, *Momordica*, *Nigella sativa* and *N. damascena*, *Strophanthus hispidus* and *S. kombe*, and *Thea*, but absent from 36 other seed drugs. R. S. C.

Crystalline globulin from *P. aconitifolius*, Jacq. K. Bhagvat (Current Sci., 1937, **5**, 587).—A cryst. globulin (total N 15·99%; tyrosine- and tryptophan-N, 2·6 and 0·5% of total N, respectively) has been isolated from the seeds of aconite bean. F. R. S.

Ricin. S. Inoue (J. Soc. Chem. Ind. Japan, 1937, **40**, 122—123B).—The protein nature of ricin (I), a toxin from the castor-oil bean, is established. The coagulation of red blood corpuscles by (I) is most complete at p_H 5·6—5·8 and p_H 8·9—9·1 (isoelectric point for (I) preps. = 5·4—5·6). E. M. W.

Anthocyanins as biological hydrogen acceptors. L. Reichel [with W. Burkart] (Naturwiss., 1937, **25**, 318).—Anthocyanins and anthocyanidins (I) are decolorised by yeast or liver in evacuated tubes at 37° and the leuco-forms undergo dehydrogenation on exposure to air. The times of decolorisation for cyanidin, delphinidin, and pelargonidin chlorides are respectively 50, 70, and 80 min. In presence of (I), aldehydes are converted into acids. P. W. C.

[Qualitative] distribution of anthocyanins in the red variety of the yellow bird's-nest (*Monotropa hypopitys*, var. *sanguinea Hausskn.*) compared with that of other plants. G. Funk (Ber. deut. bot. Ges., 1937, **55**, 322—328). F. O. H.

Colouring matter of red beetroot. O. T. Schmidt (Naturwiss., 1937, **25**, 284).—Betanin purified through its dichloropicrate contains N 5·4% and NH_2-N 2·7%. The results are consistent with the formula suggested by Ainley and Robinson (A., 1937, ii, 206). W. O. K.

Variability in carotenoid pigment content of individual plants of *Triticum vulgare* and *T. durum*. M. C. Markley (Cereal Chem., 1937, **14**, 400—409).—An account is given of wheat breeding experiments on the inheritance of carotenoid pigments. In F-2 plants from durum crosses, after corrections for kernel wt., Mendelian ratios were not found. Multiple factor inheritance was found in durum wheats. Crosses between highly pigmented Mindum durum and less pigmented Mindum × Pentad give some highly pigmented F-2 plants. E. A. F.

Constitution of herbacitrin and herbacetin.—See A., II, 326.

Practical device for the rapid determination of plant pigments. W. A. Beck (Science, 1937, **85**, 368).—The relative transmission of filtered light is measured. L. S. T.

Alkaloids of *Heliotropium lasiocarpum* and *Trichodesma incanum*. G. Menschikov (Bull. Acad. Sci. U.R.S.S., 1936, 969—981).—Previously published work (Menschikov *et al.*, 1932—1936) is reviewed. R. T.

Synthesis of *dl*-lupinine and *dl*-isolupinine.—See A., II, 355.

Constitution of nymphæine.—See A., II, 355.

The Henriot and Huguenard ultra-centrifuge in biological investigations. A. Gratia (Compt. rend. Soc. Biol., 1937, **125**, 371—375).—Modifications for determining the rate of sedimentation are described. H. G. R.

Uses of sheet viscose in microbiological technique. L. D. Galloway (Analyst, 1937, **62**, 455—456).—Its use is suggested for the microscopical examination of fungi, the study of spore germination, and for the isolation of single-spore cultures. E. C. S

Culture of human marrow. E. E. Osgood and I. E. Brownlee (J. Amer. Med. Assoc., 1937, **108**, 1793—1796).—Marrow cells are grown in 35% cord serum containing various salts. The effect of addition of other substances is described. E. M. W.

Rapid embedding with hot low-viscosity nitrocellulose. A. A. Koneff and W. R. Lyons (Stain Tech., 1937, **12**, 57—59).—Fixation, dehydration, infiltration, and embedding can be carried out in 30 hr. by using low-η cellulose nitrate at 56°. E. M. W.

Biological stain for general purposes. H. G. Cannon (Nature, 1937, **139**, 549).—Chlorazol-black E stains nuclei and chromosomes black, cytoplasm and secreted products grey, chitin green, and glycogen pink or red. No mordant and no differentiation are required. L. S. T.

Paraffin sections of formol-fixed insect material. J. A. Murray (J. Roy. Microscop. Soc., 1937, [iii], **57**, 15).—Softening of chitin by chloral hydrate–PhOH is effective on CH_2O-fixed material without damage to the tissues and persists after embedding in paraffin. The detailed technique is given. N. M. B.

Vital staining of vacuoles by neutral-red. A. Guilliermond and R. Gautheret (Compt. rend., 1937, **204**, 1377—1381).—Cultivation of mushrooms in media containing neutral-red shows that vital staining takes place only when growth is either arrested or, in the case of *Saprolegnia*, comparatively slow. E. M. W.

Automatic dehydrating device [for tissues]. J. Pennington and C. P. Hickman (Science, 1937, **85**, 249—250). L. S. T.

Micro-tonometer. M. N. J. Dirken and J. K. Kraan (Biochem. Z., 1937, **290**, 269—271; cf. Mook, A., 1932, 72, 76).—An apparatus of 6 c.c. capacity and applicable to 0·2 c.c. of blood is described. The accuracy attained is $\leq$ that of macro-methods. W. McC.

Some recent developments in electrokinetic methods and their application to biology and medicine. H. A. Abramson and L. S. Moyer (Trans. Electrochem. Soc., 1937, **71**, Preprint 12, 115—131).—New developments in the study of electrophoresis and electro-osmosis are critically discussed in regard to the examination of bacteria, blood cells, proteins, and other substances of biological interest. J. W. C.

Determination of sulphanilamide in blood and urine. E. K. Marshall, jun. (Proc. Soc. Exp. Biol. Med., 1937, **36**, 422—424).—The sensitivity and stability of the method (this vol., 211) have been increased. H. G. R.

Colorimetric determination of uric acid.—See A., II, 360.

Determination of alcohol in blood and tissues. U. Fabris (Arch. Ist. Biochim. Ital., 1937, **9**, 81—98).—The EtOH, when obtained as an aq. distillate, is heated with $K_2Cr_2O_7$ and H_2SO_4 and the products of oxidation are passed through $AgNO_3$–NaOH–NH_3 reagent, the pptd. Ag being separated, washed, dissolved in HNO_3, and titrated with 0·1*N*-KCNS, 1 c.c. of which is equiv. to 0·0023 g. of EtOH. F. O. H.

Determination of small amounts of chloral in biological substances. L. Olszycka (Bull. Soc. Chim. biol., 1937, **19**, 731—738).—A method for determination of 0·2—4 mg. of chloral in blood and tissues is described, the error being <4%. The tissue is extracted with EtOH–$COMe_2$, the inorg. Cl′ of the extract pptd. with excess of $AgNO_3$ and removed, the chloral in the filtrate treated with NaOEt, and the Cl pptd. as AgCl; this is then dissolved and titrated with KCNS. P. W. C.

Apparatus for the extraction of lipins from liquids with an immiscible solvent. H. Wu and C. Y. Chou (Chinese J. Physiol., 1937, **11**, 409—412). J. L. C.

Determination of total lipins and their constituents in small amounts of tissues. P. Monnier (Compt. rend. Soc. Biol., 1937, **124**, 1138—1140).—Methods using 1—2 g. of tissue are described. H. G. R.

Conductometric determination of micro-quantities of arginine. V. Ranganathan (Proc. Indian Acad. Sci., 1937, **5**, B, 224—230).—The method previously described for urea (this vol., 52) is adapted to the determination of arginine and depends on the change in conductivity of protein hydrolysates effected by addition of arginase and urease. $0·5 \times 10^{-4}$ g. of arginine may be determined within 1%. Results agree with those obtained by the method of Hunter and Dauphinee (A., 1930, 373). A. G. P.

Determination of perchlorates. Application to biological substances. J. Durand (Bull. Soc. Chim. biol., 1937, **19**, 739—746).—The Cl′ and ClO_4' are extracted with EtOH–$COMe_2$, the Cl′ is removed with $AgNO_3$, the ClO_4' reduced to Cl′ by boiling with S in conc. H_2SO_4, and titrated by Vohlard's method. The method is used to follow the rate of elimination of ClO_4' by man. P. W. C.

Determination of bromine in biological substances. P. S. Winnek and A. H. Smith (J. Biol. Chem., 1937, **119**, 93—101).—Modifications of Dixon's method (A., 1934, 338) are described. The Br content of various foodstuffs is given. J. N. A.

Micro-determination of iodine in biological material. H. Doering (Biochem. Z., 1937, **291**, 219—220).—A reply to Löhr and Wilmanns (this vol., 288). W. McC.

Spectrographic determination of sodium, potassium, calcium, and magnesium in biological fluids. K. B. Thomson and W. C. Lee (J. Biol. Chem., 1937, **118**, 711—721).—A method similar to that of Duffendack *et al.* (A., 1936, 41) and a rotating jet from which the solution examined flows during the sparking are described. The average error for Na and K is <3% of the amount present and for Ca and Mg somewhat greater. W. McC.

Application of dye reagents to microchemical detection of magnesium in tissues and plant-cells. B. Broda (Wiadom. farm., 1936, **63**, 6—7, 15—17; Chem. Zentr., 1936, i, 3374—3375).—The use of quinalizarin, titan-yellow, and azo-blue is described. H. N. R.