

BRITISH CHEMICAL ABSTRACTS

A., III.—Biochemistry

JULY, 1937.



Borders of physics and biology. "Scientific philosophy." C. E. GUYE (Arch. Sci. phys. nat., 1937, [v], 19, 5—21; cf. A., 1935, 651; 1936, 1149).—A discussion. F. A. A.

Comparative physiology in high altitudes. F. G. HALL, D. B. DILL, and E. S. G. BARRON (J. Cell. Comp. Physiol., 1936, 8, 301—313).—The O_2 capacity, O_2 dissociation curves, and electrolyte content of blood of various animals at different altitudes are studied. M. A. B.

Blood-oxygen changes after passive vascular exercise of the extremities. J. R. VEAL and W. M. McCORD (Proc. Soc. Exp. Biol. Med., 1937, 36, 9—11).—An increase in O_2 saturation of either superficial or deep venous blood, or both, after application of alternating negative and positive pressures to the extremities for 1 hr., indicates the likelihood of improvement in cases of arteriosclerosis following this form of treatment. P. G. M.

Sodium content of human erythrocytes. C. O. GUILLAUMIN (Bull. Soc. Chim. biol., 1937, 19, 441—445).—Blood corpuscles were separated from serum by centrifuging and, after hæmolysis, the solution was treated with CCl_3CO_2H . The filtrate contained 0.035—0.051% Na. E. A. H. R.

Effect of copper on the rate of disintegration of mammalian erythrocytes. G. C. WICKWIRE, W. E. BURGE, and R. KROUSE (Amer. J. Physiol., 1936, 116, 638—640). R. N. C.

Morphological sugar metabolism in the human leucocyte culture. G. WALLBACH (J. Lab. Clin. Med., 1935, 21, 163—168).—Normal leucocytes grown in plasma show glycogen (I) deposits during the first two days but not after the third day. Addition of (I) or glycerol to the culture increased the deposition of (I). Little or no (I) was synthesised after addition of glucose, fructose, galactose, dextrin, maltose, starch, or EtOH. Insulin or tonephin produced transient (I) storage on the second day. Insulin + glucose and lecithin emulsion + glucose markedly increased storage of (I). Thyroxine and adrenaline had no effect. CH. ABS. (p)

Enzymes of leucocytes. X. Synthesis and degradation of glycogen by leucocytes. R. WILLSTÄTTER and M. RÖHDEWALD (Z. physiol. Chem., 1937, 247, 115—126; cf. A., 1934, 93).—Determinations of the amounts of glucose (I), fructose, glycogen (II), and lactic acid (III) in mixtures of pure, fresh horse leucocytes and erythrocytes show that glycolysis does not occur in blood. (I) which disappears is converted into (II), which is then degraded to (III).

The synthesis and degradation of (II) proceed best at p_H 7.5—6.8, in presence of moderate concns. of electrolytes. W. McC.

Occurrence of protoporphyrin in reticulocytes. C. J. WATSON and W. O. CLARKE (Proc. Soc. Exp. Biol. Med., 1937, 36, 65—70).—Protoporphyrin (I) of the red blood corpuscles is mainly in the reticulocytes. (I) and brilliant-cresyl-blue are mutually precipitable. P. G. M.

Percentage of iron in hæmoglobin. B. S. WALKER and W. C. BOYD (Science, 1937, 85, 360—361).—The correct val. is approx. 0.34 and not 0.0335 (cf. lit.). L. S. T.

Formation of methæmoglobin by tissues. F. BERNHEIM and H. O. MICHEL (J. Biol. Chem., 1937, 118, 743—755; cf. A., 1936, 1133).—The production of methæmoglobin (I) from hæmoglobin by tissues is a function of O_2 uptake and is not affected by Cu or colloids. For the amount of (I) produced per unit of O_2 taken up, rat tissues form the series kidney > heart > liver > brain > muscle. Addition of KCN increases (I) production by kidney, brain, and muscle and decreases it by liver and heart. (I) production is increased by tyramine and *l*-alanine but not by succinic acid (II), *d*-alanine, or choline (III). (I) is reduced anaerobically but not aerobically. (II) and (III) reduce the extent of reduction, which, however, is much slower than when an equiv. amount of methylene-blue is reduced. W. McC.

Catalase and peroxidase activity of hæmin. F. HAUROWITZ [with R. BRDIČKA and F. KRAUS] (Enzymologia, 1937, 2, 9—16).—Paramagnetic susceptibility and the protected position of the central atom in metal-porphyrin complexes do not suffice to explain the catalase and peroxidase activities of hæmin (I). H_2O_2 combines with (I) forming a complex in which the H_2O_2 is readily reduced to H_2O . A second mol. of H_2O_2 , a readily dehydrogenated chromogen, or H evolved at a cathode can all function as the H-donor for this reduction. All three processes are catalysed by (I). E. A. H. R.

Influence of calcium and magnesium ions on the stability of hæmocyanin. J. BROSTEAUX (Naturwiss., 1937, 25, 249).—The stability zone of hæmocyanin (I) (from *Helix pomatia*) at p_H 4.3—7.3 indicated by Svedberg's sedimentation rates (A., 1934, 92) is confirmed by measurements of the mol. wt. by the light-scattering method (cf. Putzeys and Brosteaux, A., 1935, 1302). Addition of Ca or Mg extends the zone of stability on the alkaline, but not

on the acid, side. This accounts for the stability of (I) in snail's blood (p_H 7.8). E. A. H. R.

Sulphur distribution and basic amino-acids of hæmocyanin from *Limulus*. A. MAZUR (J. Biol. Chem., 1937, 118, 631—634).—The purified protein (N 17.5, S 1.22%) contains cystine 1.94, methionine 2.53, histidine 4.52, arginine 6.37, and lysine 8.92%. P. G. M.

Viscosity of solutions of different serum-proteins. C. ACHARD, A. BOUTARIC, and S. THÉVENET (Compt. rend., 1937, 204, 928—931).—The val. η/η_0 (η = val. for solution and η_0 for solvent) for solutions of albumin, myxoprotein, and globulin (from ox serum) in H_2O , 0.85% NaCl, and 0.1N-NaOH, respectively, at 26° are determined. At any concn., the vals. increase in the above order. If 0.1N-NaOH is used as a common solvent η/η_0 increases in the reverse order. In each case $(1/c) \log_e \eta/\eta_0$ is a linear function of C . Calculations indicate that albumin and myxoprotein do not behave as hydrophilic colloids when dissolved in H_2O and NaCl, respectively, but only when dissolved in 0.1N-NaOH. J. L. D.

Isoionic point of serum-proteins. II. Influence of neutral salts. G. SANDOR [with A. MARCUS] (Bull. Soc. Chim. biol., 1937, 19, 555—592; cf. A., 1936, 1008).—The isoionic point of serum-proteins can be increased by as much as p_H 0.5 in the presence of neutral salts. The magnitude of the effect depends on the nature of both protein and salt. It is greater for albumins than for globulins and SO_4^{--} has a greater effect than Cl^- . A quant. interpretation is given of the influence of SO_4^{--} on cryst. serum-albumin (horse). E. A. H. R.

Determination of the tyrosine index of serum-polypeptides. V. CIOCALTEU and G. TANASESCO (Compt. rend. Soc. Biol., 1937, 125, 295—297). H. G. R.

Tyrosine index of serum-polypeptides. "Tyrosine-reducing" value of trichloroacetic acid filtrates. V. CIOCALTEU and G. TANASESCO (Compt. rend. Soc. Biol., 1937, 125, 297—299).—The tyrosine index and "tyrosine-reducing" val. are normally 0.025—0.045 and 0.068—0.105 g. per litre of serum, respectively. H. G. R.

Determination of phospholipins in ox blood. G. ELLIS and L. A. MAYNARD (J. Biol. Chem., 1937, 118, 701—709).—Solubility in light petroleum of all phospholipins (I) extracted with $EtOH-Et_2O$ is achieved by distillation in a vac. at low temp. Oxidative determinations then approx. agree with those of (I)-P. The presence of sphingomyelin was demonstrated directly in plasma, and indirectly in the corpuscles from the (I): fatty acid ratios. There is no evidence that blood-(I) is a precursor of milk-fat. R. M. M. O.

Influence of glucose injection on amino-acid-nitrogen, urea-nitrogen, and hæmoglobin concentration in blood. E. G. SCHMIDT and J. S. EASTLAND (J. Lab. Clin. Med., 1935, 21, 1—12).—The decrease in blood- NH_2 -acids and -urea during glucose tolerance tests in normal cases and in certain diseases is examined. Vals. were unrelated to the degree of hyperglycæmia attained during the tests

or to changes in blood-vol. as shown by hæmoglobin concns. CH. ABS. (p)

Influence of sucrose ingestion on amino-acid- and urea-nitrogen concentration of the blood. E. G. SCHMIDT and J. S. EASTLAND (J. Lab. Clin. Med., 1935, 21, 233—235).—Ingestion of sucrose caused a smaller reduction in NH_2 -acid- and urea-N vals. than did that of glucose. CH. ABS. (p)

Hydrolysis of cholesteryl esters in blood with 50% alcohol. Micro-determination. M. NORIEGA DEL AGUILA (Bol. Soc. Quím. Peru, 1936, 2, 217—218; cf. A., 1935, 880).—In the determination of cholesterol previously described, the solution of NaOH in $EtOH$ is replaced by 50% $EtOH$ (cf. Grigaut, A., 1935, 1261). F. R. G.

Composition of the blood of the hen during its life cycle. V. G. HELLER and L. PURSELL (J. Biol. Chem., 1937, 118, 549—553).—There are no significant changes in any constituent of hen's blood (Rhode Island Reds) during the first two years of life. Urea is <, and uric acid and glucose are >, the % in the blood of other domestic animals. P. G. M.

Inheritance of biochemical characters by animals and its relation to their growth. I. Glutathione concentration in the blood and difference in size of breeds of farm animals. II. Catalase content of the blood of horned cattle and sheep. V. I. PATRUSCHEV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 573—577 and 579—584).—I. The average glutathione (I) content of the blood of cattle and sheep varies according to breed, the larger and more rapidly growing breeds tending to have high vals. The light but active Kalmyk cattle which have high blood-(I) are an exception. In crosses of the first generation, the blood-(I) approximates to that of the parent with the lower val.

II. The catalase content of the blood likewise differs according to breed, the order being approx. the same as in the case of (I). W. O. K.

Determination of alcohol in blood (modification of Liebesny's method). K. WREDE and H. SCRIBA (Pharm. Zentr., 1937, 78, 267—268).—Details are given of improvements of the method described by Heiduschka and Steulmann (cf. A., 1936, 1009). W. O. K.

Homoglycæmic or hypoglycæmic curves for injection of glucose. J. A. PANGARO (Dia méd., 1934, 6, 731).—Homo- or hypo-glycæmic curves in which "hyperglycæmic waves" are lacking are related to latent hyperinsulinism. CH. ABS. (p)

Distribution of glucose in blood. I. NEUWIRTH (Amer. J. Physiol., 1936, 117, 335—337).—Human and rabbit blood corpuscles contain a considerable % of the total blood-glucose, their permeability to which is unchanged by $C_2O_4^{--}$; this does not confirm Olmsted's results (cf. A., 1935, 1392; 1936, 1399). R. N. C.

Preliminary blood survey of Masai cattle in drought periods. M. H. FRENCH (Ann. Rept. Vet. Sci. Tanganyika, 1934, 65—68).—After long intervals without H_2O , blood-Ca, -K, -Na, and -inorg. P in cattle were not significantly changed. A large

intake of H_2O after 3 days' thirst slightly lowered blood-haemoglobin but did not alter inorg. P.

CH. ABS. (p)

Effect of bleeding on distribution of ions between erythrocytes and plasma in arterial blood. II. F. SCHMITT and W. BASSE (Arch. exp. Path. Pharm., 1937, 184, 531—537).—Removal of 500 c.c. of arterial blood in dogs causes a fall, followed by a rise to initial val., in the CO_2 -binding capacity of the blood, but a rise above the initial val. was never observed. Electrolyte changes between plasma and red cells are similar to those in venous blood (cf. A., 1936, 1135).

P. W. C.

Changes in blood chemistry in experimental caustic poisoning. I. G. VON FAZEKAS (Arch. exp. Path. Pharm., 1937, 184, 587—604).—In experimental NaOH-poisoning in rabbits the following changes occur: hyperglycemia, considerable increase in inorg. PO_4''' of whole blood, decrease of serum-Ca, considerable increase of serum-Cl', slight increase of serum-Na, and decrease of serum-alkali reserve.

P. W. C.

Presence and partition of sodium between erythrocytes and plasma of the blood of man and animals. S. RASZEJA (Bull. Soc. Chim. biol., 1937, 19, 593—601).—The Na contents of erythrocytes of the horse, rabbit, and pig are of the same order as that of human erythrocytes. Prolonged and rapid centrifuging and washing with isotonic glucose removes part of the Na.

E. A. H. R.

Distribution of chlorine and urea in blood and bile. O. MISETA (Rev. med. quir. patol. fem., 1935, 5, 69—124).—The concn. of urea in blood and bile was 0.24—0.49 and 0.19—0.44 and that of Cl' 4.0—4.8 and 4.8—5.6 g. per litre, respectively.

CH. ABS. (p)

Blood-nitrite. E. J. STIEGLITZ and A. E. PALMER (Arch. Int. Med., 1937, 59, 620—630).— NO_2' was determined colorimetrically by the intensely coloured azo-dye produced with $\alpha-C_{10}H_7 \cdot NH_2$ and $2:6:8-NH_2 \cdot C_{10}H_5(SO_3Na)_2$. This gives average blood concn. 0.8×10^{-6} g. per 100 c.c. with a seasonal variation. Sweat and saliva have similar vals. Urine and cerebrospinal fluid gave negative results, but NO_2' may be obscured by H' , OH' , or phosphate. Various possibilities for the biochemical origin and destruction of NO_2' are considered.

R. M. M. O.

Blood as a physico-chemical system. XI. Man at rest. D. B. DILL, H. T. EDWARDS, and W. V. CONSOLAZIO. XII. Man at high altitudes. D. B. DILL, J. H. TALBOTT, and W. V. CONSOLAZIO (J. Biol. Chem., 1937, 118, 635—648, 649—666).—In the acclimatised condition the cell:plasma distribution of CO_2 retains the normal relation to p_H and oxygenation but there is a definite increase in serum-Cl', causing a consistently lower cell:plasma ratio for Cl'. The polycythemia increases the buffer val. of the blood so that p_H changes through the respiratory cycle are slighter. The neutralising capacity for fixed acids, however, is lowered through a diminution in HCO_3' . Other ions show little change. A nomographic description of the behaviour of the blood-electrolytes is established.

R. M. M. O.

Comparison of changes in the p_H of arterial blood and saliva during variations of pulmonary ventilation. C. R. BRASSFIELD (Amer. J. Physiol., 1936, 116, 174—181).—Arterial p_H in the dog remains const. during resting conditions, but saliva p_H shows large variations, mostly towards the alkaline side. Reduction of O_2 tension in the inspired air causes an initial rise in both, followed by a fall below resting level; a marked rise follows restoration of normal conditions. NaCN raises both blood and saliva p_H during respiratory stimulation; subsequent temporary respiratory failure, and in the case of saliva increased secretory rate, cause a fall. The initial rise of p_H in saliva with NaCN or reduced O_2 supply is considered to be due to a fall in CO_2 produced by hyperventilation, subsequent changes being due to disturbances of cellular metabolism.

R. N. C.

Spectrography of serum ultrafiltrates. W. KLEIN [with E. GABER and M. FÖRSTER] (Z. physiol. Chem., 1937, 246, 224—232).—Spectrographic curves are given for normal serum ultrafiltrates, adsorption (Al_2O_3 , C) and EtOH- and Et₂O-sol. fractions, and ultrafiltrates after removal of uric acid by uricase preps. Curves are also given for sera from cases of diabetes, nephrosis, uraemia, and pneumonia.

F. O. H.

Colorimetric determination of the volume of circulating blood. Use of Congo-red for determining the plasma/blood ratio and circulatory plasma. T. L. GINO (Arch. Ist. Biochim. Ital., 1937, 9, 19—56).—The methods are described.

F. O. H.

Blood spots. L. VAN ITALLIE (Bull. Soc. Chim. biol., 1937, 19, 413—433).—A lecture.

Effect of antiseptics on the course of the Bordet-Wassermann reaction. A. ROUSLACROIX, L. BOYER, and R. GASTINEL (Compt. rend. Soc. Biol., 1937, 125, 71—74).—Salts of 8-hydroxyquinoline do not affect the course of the reaction and can be used as antiseptics.

H. G. R.

Preservation of blood for the Bordet-Wassermann reaction with 8-hydroxyquinoline sulphate. A. ROUSLACROIX, L. BOYER, and R. GASTINEL (Compt. rend. Soc. Biol., 1937, 125, 74—76).—A concn. of 0.01% is recommended to keep the blood sterile for a moderate time.

H. G. R.

Application of the retarding action of cold on blood-coagulation to the determination of fibrin. R. SASSIER (Compt. rend. Soc. Biol., 1937, 125, 17—19).—The blood is surrounded by ice during centrifuging, the val. for fibrin by this method being slightly > that from oxalated blood.

H. G. R.

Coagulation. Bleeding and blood-calcium: its modification by ingestion of a mixture of calcium lactate and ammonium chloride. R. A. POLETTI (Dia méd., 1934, 6, 1091).—Oral administration of NH_4Cl with Ca lactate (I) diminishes the coagulation and bleeding time as compared with that of (I) alone. Blood-Ca is unaffected.

CH. ABS. (p)

Analysis of coagulant activation. J. H. FERGUSON (Amer. J. Physiol., 1936, 117, 587—595).—The low coagulating power of prothrombin (I) in

presence of Ca alone is abolished by extraction with C_6H_6 , but restored and increased by addition of kephalin (II). Boiling the (I) also prevents activation by Ca alone, but increases the potency of the thrombin (III) formed on addition of (II), possibly through weakening of antithrombins by release of extra (II). (III) is not inactivated by extraction with C_6H_6 . (II) is considered necessary for formation of (III), which contains (I), (II), and Ca in chemical combination. The activation of (I) by Ca alone is due to the presence in (I) and fibrinogen of a (II)-like phospholipin "available" for (III) formation. (I) probably originates from serum-globulins.

R. N. C.

Effect of sulphur compounds on the coagulation of blood. J. H. STERNER and G. MEDES (Amer. J. Physiol., 1936, 117, 92—101).—Cysteine (I), taurine, and taurocholic acid, added to whole blood, prolong the time of coagulation. The action of (I) is to prevent the activation of prothrombin; its effects on tissue factor, Ca, thrombin, and fibrinogen are negligible. Ascorbic acid, phenosafranine, and Na_2HPO_4 are without effect under the same conditions. (I) and methionine increase the times of bleeding and coagulation when administered orally and intravenously to man (cf. A., 1936, 1531).

R. N. C.

Determination of the clotting time of blood and plasma. W. SZANKOWSKI (Arch. exp. Path. Pharm., 1937, 184, 317—326).—The method is described.

P. W. C.

Heparin and the formation of white thrombi. C. H. BEST, C. COWAN, and D. L. MACLEAN (Science, 1937, 85, 338—339).—Purified heparin is effective in preventing the formation of white thrombi in dogs suffering vein injury.

L. S. T.

Occurrence of a substance in red algæ which inhibits blood-coagulation. H. ELSNER, W. BROSER, and E. BÜRGE (Z. physiol. Chem., 1937, 246, 244—247).—Crude preps. of the polysaccharide sulphuric ester from agar or carrageen and the Na salt of galactan sulphuric ester from *Iridaea laminarioides* have an inhibitory effect on blood coagulation comparable with that of heparin preps.

F. O. H.

Titre of antitoxic serum. M. WEINBERG and M. GUILLAUMIE (Compt. rend., 1937, 204, 1012—1015; cf. this vol., 6).—The age of a toxin influences its activity, as does the source of the serum, whether measured by the dose test or the min. lethal dose for a mouse. The antitoxic titre (dose test) of antiperfringens serum (376) varies from 50 to 325 units depending on the batch of toxin used even if the serum source is the same. The titre is independent of the hæmolytic properties of the toxin.

J. L. D.

Salt optimum in antibody-antigen reactions. J. T. DUNCAN (Brit. J. Exp. Path., 1937, 18, 108—119).—[NaCl] affects the quantity of antibody (I)-antigen (II) compound formed and its (I)/(II) ratio. The optimum [NaCl] depends on the (II) concn. If the [NaCl] is altered after formation of the compound, the composition of the latter changes to that which it would have had if originally formed under the new conditions, i.e., NaCl influences the equilibrium of a

reversible association. Optima for *H* and *O* agglutinations are distinct so that pure *H* or *O* (II) may be separated by application of equilibrium principles.

R. M. M. O.

Chemical nature of the immuno-specific capsular substance of anthrax bacilli. G. IVÁNOVICS and V. BRUCKNER (Naturwiss., 1937, 25, 250).—The immuno-sp. capsular substance of *B. anthracis* was extracted with dil. alkali and purified through its heavy-metal salts and by dialysis. It is a polypeptide-like substance, $[\alpha]_D^{20} -21^\circ$, built up from *l*-glutamic acid units.

E. A. H. R.

Viscous protein of anti-anthrax serum. L. PLACIDI and C. MOREL (Compt. rend. Soc. Biol., 1937, 125, 234—236).—The precipitin of anti-anthrax serum is localised in the viscous protein (this vol., 83).

H. G. R.

Antigenic components of the toxins of *Cl. botulinum* types C and D. J. H. MASON and E. M. ROBINSON (Onderstepoort J. Vet. Sci., 1935, 5, 65—75).—Results of injection of toxic filtrates into goats indicated that types A and B are mono-sp., that type C contains 3 components C_1 , C_2 , and D (slight amounts), and that type D contains chiefly D but small amounts of C are present.

CH. ABS. (p)

Toxicity of mixtures of *B. coli* toxins and antiserum. G. MAGHERU, A. MAGHERU, and E. BARBULESCU (Compt. rend. Soc. Biol., 1937, 125, 309—310).—The toxicity of the mixture of insol. endotoxin and serum decreases with dilution of the serum.

H. G. R.

Preparation of antiserum for *B. coli*. G. MAGHERU, A. MAGHERU, and H. CREANGA (Compt. rend. Soc. Biol., 1937, 125, 306—308).—A mixture of the neurotropic, enterotropic, and insol. endotoxins immunises the horse without the addition of the complete antigen.

H. G. R.

Preparation of a multivalent antiserum for *B. coli*. O. S. GWAN (Compt. rend. Soc. Biol., 1937, 125, 228—231).

H. G. R.

Alum-diphtheria toxoid precipitate. E. BUXBAUM and C. K. GREENWALD (J. Lab. Clin. Med., 1935, 21, 157—163).—An alum concn. of 2% is required to ppt. toxoids prepared from bacto-veal broth, and one of 1.5% for that from fresh veal broth. The conc. toxoid from fresh veal contains the greater no of L_f units per g. of N.

CH. ABS. (p)

Analysis of dysentery toxin by means of the flocculation reaction. K. HALAPINE (Ann. Inst. Pasteur, 1937, 58, 599—608).—Three zones are given in precipitin tests with dysentery filtrate. This has been used as a basis for separating the toxin into three fractions, obtained by heat in one case and by sp. adsorption in the other two.

L. D. G.

Antigen-O and *Pyocyanus* endotoxin. A. BOIVIN and L. MESROBEANU (Compt. rend. Soc. Biol., 1937, 125, 273—275).—The polysaccharide haptens are not toxic to mice even in doses of 5 mg. per animal.

H. G. R.

Anti-complementary power of guinea-pig serum. L. NATTAN-LARRIER, L. GRIMARD, and

J. DUFOUR (Compt. rend. Soc. Biol., 1937, 125, 270—273).—Anti-complementary power is developed by heating the serum to 56—62° but the strength is < that obtained in human serum by ageing.

H. G. R.

Fixation of the complement in streptococcic infections. R. DEMANCHE and M. LEVY-BRUHL (Compt. rend. Soc. Biol., 1937, 125, 236—238).—EtOH extracts of streptococci can be used as stable antigens for the fixation of the complement reaction.

H. G. R.

Polysaccharide and lipin-polysaccharide tubercular antibodies. K. MEYER (Compt. rend. Soc. Biol., 1937, 124, 1288—1290).—The protein and lipin-protein antibodies (A., 1936, 877; this vol., 117) are in reality sugar and lipin-sugar antibodies.

H. G. R.

Antigenic composition and virulence of *B. typhosus* grown on a chemically defined medium. G. P. GLADSTONE (Brit. J. Exp. Path., 1937, 18, 67—82).—Viantigen formation, non-agglutination with a pure *O* anti-serum, and virulence are retained by the organisms whatever the source of N, but are lost in the absence of glucose, when the C and energy source is either lactate or other products of glucose metabolism.

R. M. M. O.

Influence of calcium and potassium chlorides on the production of agglutinins anti-*O* and -*H*. A. ROSA (Boll. Soc. ital. Biol. sperim., 1936, 11, 1015—1017).—Injection of aq. CaCl_2 increases the production of both anti-flagellatory (*H*) and anti-somatic agglutinin (*O*) in rabbits inoculated with *B. typhosus* whilst that of aq. KCl significantly increases the production only of the *H* agglutinin. F. O. H.

Viantigen of *B. typhosus*. V. Action of formaldehyde. VI. Active and passive immunity. A. GIOVANARDI (Boll. Soc. ital. Biol. sperim., 1937, 12, 4—7, 7—10).—V. In presence of 0.2—1.0% of CH_2O , the viaggglutinin is no longer demonstrable in suspensions of *B. typhosus* after 2 days at 37° or after 4 months at 20°. The non-destruction of the agglutinin in the experiments of Felix *et al.* (A., 1935, 1420) was therefore due to the low temp. used.

VI. Comparative data for the immunising action in rabbits and mice of viantigen preps., vaccines sterilised by 0.2—0.5% of CH_2O at 37° for 3—30 days, and vaccines from strains of *B. typhosus* free from viantigen are discussed.

F. O. H.

Detoxication of *Vipera aspis* venom by sodium ricinoleate and vaccination of rabbits with the detoxicated venom. E. CESARI and P. BOQUET (Compt. rend. Soc. Biol., 1937, 125, 231—234).—The antigenic power is not lost by detoxication of the venom by Na ricinoleate at p_H 7.6 for 24 hr. at 37°.

H. G. R.

Immunological applications of placenta extracts: oral administration. C. F. MCKHANN, A. A. GREEN, L. E. ECKLES, and J. A. B. DAVIES (Ann. Intern. Med., 1935, 9, 388—397).—Protein extracts composed of globulins from human placenta contain diphtheria and scarlet fever antitoxins and antibodies neutralising poliomyelitis virus and protect susceptible children against measles. CH. ABS. (p)

Has alexin a corpuscular nature? I. LOMINSKI (Compt. rend., 1937, 204, 917—919).—Alexin, like bacteriophage, is probably not in solution, but is corpuscular and discontinuously distributed in serum.

F. A. A.

Active principles of lysogenic filtrates. G. PROCA (Compt. rend. Soc. Biol., 1937, 125, 299—302).—Active lysogenic filtrates promote the growth of secondary colonies which become lysogenic.

H. G. R.

Electrophoresis of immune sera. M. LOURAU-DESSUS (J. Chim. phys., 1937, 34, 149—195).—An apparatus and technique are described with which electrophoresis of serum-proteins etc. may be carried out without causing detectable irreversible changes in them. The distribution of antibody function during electrophoresis indicates that this is the property of a particle having a small charge and isoelectric point p_H 6.2—6.3, comparable with proteins, but not identical with any known protein. In syphilitic sera, sensitivity to the Bordet-Gengou and Bordet-Wassermann reactions is distributed like the antibody, but the distribution of sensitivity to the Kahn flocculation reaction resembles that of globulin.

F. A. A.

Chemical composition of organisms as a specific property. III. Manganese in insects (Formicidæ). A. P. VINOGRADOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 357—359).—The Mn content of various genera of the Formicidæ is characteristic of each genus. No differentiation is apparent among the Acrididæ, the food of which is of much greater uniformity.

A. G. P.

Biochemistry of bromine. II. Bromine content of human tissues. A. H. NEUFELD (Canad. J. Res., 1937, 15, B, 132—138; cf. A., 1936, 1011).—Br is a constituent of all human tissues but varying amounts are found in the same tissues. Br is not concerned with pituitary function. There is no relation between the distribution of Br and Cl in human tissues.

E. A. H. R.

Abundance ratio of isotopes of potassium in animal tissues. A. K. BREWER (J. Amer. Chem. Soc., 1937, 59, 869—872).—The ratio $^{39}\text{K} : ^{40}\text{K}$ is about 14:20 for most organs, agreeing with previous vals. for plants, minerals, and ocean H_2O . Bone-marrow is high in ^{41}K and there is evidence of a possible relation between abundance ratio and the age of the animal.

E. S. H.

Chemical composition of teeth. V. Spectrographic analysis. F. LOWATER and M. M. MURRAY (Biochem. J., 1937, 31, 837—841; cf. A., 1936, 878, 883).—In addition to constituents already known to exist in dental tissue, Na, Ag, Pb, Sr, Ba, Cr, Sn, Zn, Mn, Ti, Ni, V, Al, Si, B, Cu, and Fe were always found. A trace of F was found in human "mottled teeth" and a large amount in the teeth of F-fed rats but not of normal dogs and rats. K occurs only in enamel and dentine of "mottled teeth" and in F-fed rats' teeth.

E. A. H. R.

Double thread structure of human tooth-enamel.—See A., I., 351.

Orientation of crystallites in single [tooth-] enamel prisms.—See A., I., 351.

Choline in biochemistry. E. KAHANE (Bull. Soc. Chim. biol., 1937, 19, 205—233).—A lecture.

Basic constituents of lampreys. E. STRACK, H. SCHWANEBERG, and G. WANNSCHAFF (Z. physiol. Chem., 1937, 247, 52—62; cf. A., 1936, 499; this vol., 108).—The choline chloride (I) and betaine chloride contents of the muscle, intestines (without the liver), and liver of lampreys (*Petromyzon fluviatilis*) are 0.03, 0.015, and 0.0025%, and 0.07, 0.088, and 0.03%, respectively. γ -Butyrobetaine chloride occurs in the liver (0.014%) and muscle. The biological action of extract of the muscle is due to (I) only. Lampreys contain no neosine, homocholine, or homobetaine.
W. McC.

Quantitative preparation of l-cystine from keratin (horse-hair). A. WEIDINGER (Rec. trav. chim., 1937, 56, 562—564).—Details are given for the quant. isolation (error 0.3%) of cystine by hydrolysis of the fat-free hair with boiling 20% HCl, removal of HCl at 60°/reduced pressure, buffering to p_H 4 with NaOAc, dissolution of the ppt. in 4% HCl, decolorisation with PO_4^{3-} -free animal charcoal, pptn. from the conc. filtrate with NaOAc, and purification with $COMe_2$. The S contents of the original hair and that calc. from the isolated cystine were, respectively, 3.45 and 3.32%.
J. W. B.

Decomposition of human hair by boiling with concentrated magnesium chloride solution. K. SCHUSTER (Z. physiol. Chem., 1937, 247, 6—8; cf. Zeynek and Dimter, A., 1936, 227).—Human hair boiled for 100 hr. in N_2 at approx. 115° with 40% aq. $MgCl_2$ saturated with NaCl (p_H 6.6) lost a very small amount of free S, 0.18% of S as H_2S , 0.024% of NH_3 , and 1.024% of sol. N (0.141% as NH_4Cl), the total loss being 6.4%. The residual hair (but not untreated hair) gave with 0.1N-NaOH a homogeneous jelly after 1 week at 37° but was not attacked by trypsin. Hair boiled for 30 and 100 hr. with $MgCl_2 + NaCl$ yielded 0.55% of and no cystine, respectively, when hydrolysed with conc. HCl.
W. McC.

Physical and chemical properties of casein fat. S. G. STEVENSON and A. L. BACHARACH (Biochem. J., 1937, 31, 721—723).—The analytical determinations for the characterisation of natural fats show that casein fat is in most respects indistinguishable from butter fat. The former, however, contains three times as much unsaponifiable matter as the latter.
E. A. H. R.

Lipin content of the organs of young rats. A. LANG (Z. physiol. Chem., 1937, 246, 219—223).—The body-wt. and phospholipin (I) and total cholesterol contents of the brain increase rapidly during the first 30—40 days of life and then remain fairly const. or slowly increase. The liver-cholesteryl esters increase, then decrease rapidly, during this period, afterwards remaining approx. const. at the lower level. The liver-(I) increases only slightly with age. The variations in the data from different rats are emphasised.
F. O. H.

Water and fat content of tsetse flies. C. H. N. JACKSON (Nature, 1937, 139, 674—675).—Data concerning the H_2O and fat contents of tsetse flies

at different stages of hunger and of different ages are discussed. In agreement with Jack (this vol., 87) the wt. of fat should be excluded when the % of H_2O is calc.
L. S. T.

Water and fat content of tsetse flies. K. MELLANBY (Nature, 1937, 139, 883).—A criticism (cf. preceding abstract).
L. S. T.

Chemistry of muscle-glycogen. F. G. YOUNG (Biochem. J., 1937, 31, 711—715).—Liver- and muscle-glycogen do not differ appreciably in their properties, although some specimens of the latter give solutions differing from those of the former in opalescence and in coloration with I.
E. A. H. R.

Pigments associated with the fatty tissues of plants and animals. I. M. HEILBRON and A. E. GILLAM (Nature, 1937, 139, 612—615, 657—660).—An address.
L. S. T.

Pigments of the eggs and skin of the chameleon. C. MANUNTA (Boll. Soc. ital. Biol. sperim., 1937, 12, 33—34).—The skin and liver contain xanthophyll (I) (free and esterified) and smaller amounts of carotene (II); large amounts of free (I) and traces of (II) occur in the eggs.
F. O. H.

Carotenoids of cocoons from a crossed strain of silkworm. C. MANUNTA (Boll. Soc. ital. Biol. sperim., 1937, 12, 31—32).—The carotenoids occurring in cocoons from various strains of silkworms are discussed from the viewpoint of the Mendelian theory.
F. O. H.

Quantitative relations between visual stimuli and the production or destruction of melanin in fishes. F. B. SUMNER and P. DOUDOROFF (Proc. Nat. Acad. Sci., 1937, 23, 211—219).—The melanin content of the goby fish (*Gillichthys mirabilis*) approx. \propto the log of the albedo of the tank in which it has been kept (albedo = ratio of reflected to direct light) and is only slightly dependent on the abs. intensity of the illumination.
W. O. K.

Variations in the proportions of the constituents of the silk secretion in different parts of the silk-glands during development. C. MANUNTA (Bull. Soc. ital. Biol. sperim., 1937, 12, 32—33).—The proportion of sericin in the silk filament in the anterior is > that in the posterior part of the silk gland; it also decreases gradually during growth of the worm. The fibroin core of the filament appears to move towards the secretory pores at a rate > that of the sericin layer.
F. O. H.

Methods of separation of thyroglobulins. I. A. SMORODINCEV and A. M. FELDT (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 365—368).—High purity in thyroglobulin (I) preps. is ensured by salting out with $(NH_4)_2SO_4$ after pptn. of nucleoproteins by AcOH. (I) is not pptd. by AcOH unless denatured. Nucleoproteins are pptd. by half-saturated aq. $(NH_4)_2SO_4$. (I) obtained by pptn. by EtOH is impure.
A. G. P.

Ultracentrifugal studies of compounds of proteins with polysaccharides. Compounds between proteins and glycogen. E. M. MYSTKOWSKI (Biochem. J., 1937, 31, 716—720).—Glycogen (I) shows great polydispersity in aq. solution. There

is evidence for combination of (I) with serum-globulin (II) in mixtures of the two. Only small particles of (I) combine with (II). (I) does not combine with lactoglobulin. E. A. H. R.

Preparation of proteins by ultracentrifuging. R. W. G. WYCKOFF (Compt. rend. Soc. Biol., 1937, 135, 3—5). H. G. R.

Thermal transformations of elastoidin. E. FAURÉ-FREMIET (J. Chim. phys., 1937, 34, 125—135).—The re-formation of elastoidin-I from -II (see A., 1936, 1462) at $<62^\circ$ and under tension is not complete. Under the conditions of formation of -II, some hydrolysis takes place, with production of an albumose and loss of S, and the re-formed -I is hydrolysed by trypsin, though less rapidly than is -II. F. A. A.

X-Ray study of the structure of elastoidin fibres.—See A., I, 350.

Polarisation studies in collodion membranes and in synthetic protein-lipin membranes.—See A., I, 359.

Molecular structure of chromosomes. D. M. WRINCH (Protoplasma, 1936, 25, 550—569).—A cylindrical structure consisting of parallel and identical chains of protein mols. held together laterally by salt linkings with nucleic acid mols. is postulated. The specificity of the individual chromosome is determined by the particular proteins in the chains. The linkings between the protein mols. in the chain constitute natural breaking points in the chromosome micelle and the genes are the short lengths of micelle between consecutive breaking points. M. A. B.

Irradiated protein as oxidation catalyst of unsaturated acids. E. KATHER (Arch. exp. Path. Pharm., 1937, 184, 645—658).—Ovalbumin (I) forms a Cu complex which catalyses the oxidation of unsaturated acids. (I) irradiated with ultra-violet light forms a Cu complex which is 5—10 times as active as that from unirradiated (I). The SH groups liberated on irradiation take part in the formation of the Cu complex. P. W. C.

Catalytic action of iron. IV. Activation of iron. F. EICHHOLTZ and K. UNGERECHE (Arch. exp. Path. Pharm., 1937, 184, 605—611; cf. A., 1935, 781).—Conversion of subcutaneously injected Fe^{II} into the catalytically active form in mice is measured with and without simultaneous injection of *d*- and *l*-tartaric, dihydroxytartaric (I), dihydroxymaleic (II), malic (III), and acetonedicarboxylic (IV) acid. (I), (II), and (III) activate Fe^{II} *in vivo* and the very considerable activations of Fe^{III} citrate and tartrate are due to degradation products of these acids. (IV) has only a small activating action. P. W. C.

Phosphorescence of cells and cell products. A. C. GIESE and P. A. LEIGHTON (Science, 1937, 85, 429).—The results of tests on org. materials of biological origin are recorded. L. S. T.

Classification of biological colloids. S. J. VON PRZYŁĘCKI (Kolloid-Z., 1937, 79, 129—137). F. L. U.

Calcium content of human milk, as influenced by administration of calcium, irradiated ergosterol, and parathyroid hormone. L. ROSSI (Clin. pediatr., 1934, 16, No. 10).—The Ca content of milk is increased considerably by feeding parathormone, less by irradiated ergosterol, and not at all by Ca. CH. ABS. (p)

Diffusion of calcium from milk through membranes of varying permeability. G. SARZANA (Boll. Soc. ital. Biol. sperim., 1936, 11, 1031—1032).—Diffusion of Ca from cow's milk through collodion and parchment membranes against aq. KCl or CaCl_2 or H_2O indicates the presence of two Ca fractions, one readily diffusible and the other non-diffusible through membranes of low permeability (cf. A., 1936, 1405). F. O. H.

Electrophoresis of the diffusible calcium of milk. G. SARZANA (Boll. Soc. ital. Biol. sperim., 1936, 11, 1032—1033).—The transport of Ca during electro-dialysis of whole milk and electrophoresis of milk ultrafiltrates or aq. CaCl_2 + Na citrate + K phosphate at $p_H < 7$ is to the cathode (cf. Peretti, A., 1935, 698). F. O. H.

Micro-determination of potassium and sodium in milk. M. SATO and K. MURATA (Bull. Agric. Chem. Soc. Japan, 1937, 13, 318—322).—K is determined in the deproteinised milk (5 c.c.) by pptn. as K cobaltinitrite, which is dissolved in HNO_3 and then reduced with dimethylglyoxime and Na_2S , the colour thus produced being compared with a standard. Na is determined by pptn. as pyroantimonate, which is dissolved in conc. HCl and titrated iodometrically. J. N. A.

Microphotographic study of the fat globules of the milk of Indian breeds of cows and buffaloes. Z. R. KOTHAVALLA and S. D. SUNAWALA (Indian J. Vet. Sci., 1937, 7, 8—14).—Buffalo milk contains a smaller no. but larger sized fat globules than cow's milk and is more suitable for butter and ghee making. Draught cows give less milk containing more globules of a more uniform size than milch cows. The milch breeds do not show marked variation in the no., size, and shape of globules. W. L. D.

Less-known constituents of milk and their examination. Curdling of milk: the curdling enzyme. Oxidation-reduction systems in milk.—See B., 1937, 611.

Comparison of the chemical composition of stimulated and resting saliva of caries-free and caries-susceptible children. J. WHITE and R. W. BUNTING (Amer. J. Physiol., 1936, 117, 529—532).—There is no apparent difference in composition between salivas from the two classes. Ca and P in resting salivas are $>$ in stimulated salivas, whilst CO_2 is less. R. N. C.

Lysozyme content of tears. W. M. JAMES (Amer. J. Ophthalmol., 1935, 18, 1109—1113).—No relation was apparent between the bacteriolytic titre (*M. lysodeikticus*) of tears and the age, sex, or race of the subject. CH. ABS. (p)

Hepatic excretion in man of bile acids after oral administration. H. DOUBLET (Proc. Soc.

Exp. Biol. Med., 1937, 36, 50—52).—Oral administration of cholic acid is more effective than that of deoxycholic acid in raising the concn. and total output of bile acids in hepatic bile.
P. G. M.

Viscosity of bile solutions. C. ACHARD, A. BOUTARIC, and P. BERTHIER (Compt. rend., 1937, 204, 1049—1051).—A table summarises the relative η at 26° of varying dilutions of centrifuged ox bile in H_2O .
P. W. C.

Validity of fractional gastric analysis. F. A. HELLEBRANDT and E. BROGDON (Amer. J. Digest. Dis. Nutrition, 1935, 2, 402—408).—The secretory response of the stomach in normal subjects varied considerably irrespective of the stimulant used (oatmeal, EtOH, histamine). Fractional gastric analysis is of doubtful val. in quant. studies of gastric function but is preferable for detection of acidity or secretory capacity.
CH. ABS. (p)

Autoregulation of gastric secretion. J. J. DAY and D. R. WEBSTER (Amer. J. Digest. Dis. Nutrition, 1935, 2, 527—531).—Introduction of dil. HCl or dil. gastric juice into the duodenum inhibits gastric secretion. Passage of acid chyle from stomach to duodenum probably restricts the secretion.
CH. ABS. (p)

Rôle of the duodenal secretions in the prevention of experimental jejunal ulcer. C. M. WILHELMJ, F. T. O'BRIEN, H. H. MCCARTHY, and F. C. HILL (Amer. J. Physiol., 1936, 117, 79—85).
R. N. C.

Rôle of duodenal regurgitation in the automatic regulation of the gastric acidity. C. BOLTON and G. W. GOODHEART (J. Physiol., 1936, 87, 360—387).—Total acidity and total Cl' in the contents of the isolated secreting stomach of the cat increase steadily and at the same rate, although the gastric mucus tends to exert a neutralising effect. Arrest of secretion by atropine flattens both curves, but the action of mucus on emptying the stomach is exaggerated. Cl' in specimens from the fundus is slightly > in those from the pyloric end, but the acidity is the same in both portions. Acid secretion occurs in the fundus, and if the pyloric portion is ligatured from the fundus, its contents remain neutral. If the pylorus is left open, the acidity is automatically kept below 0.05—0.06N by regurgitation of the duodenal contents at this val. The neutralisation takes place in the duodenum.
R. N. C.

Regulation of reaction of the acid-base equilibrium in normal urine. C. DIENST (Arch. exp. Path. Pharm., 1937, 184, 547—557).—The conditions for excretion of non-volatile acids in the urine as NH_4 or Na salts are examined. Excretion as NH_4 salts occurs only when the diet contains excess of protein and as Na salts only when it contains excess of base. If the diet contains excess of acid and is deficient in protein, the acid is excreted by carnivora as NH_4 salts, NH_3 being derived from fixed protein, and retention of Na occurs. At still higher acidity, Na is also utilised for excretion of acid, the alkaline reserve decreasing but excretion is still predominantly as NH_4 salts. Under these conditions with herbivora, the results are similar but the loss of Na is greater.
P. W. C.

Emotional change in urinary p_H in airmen. A. MANGIACAPRA (Boll. Soc. ital. Biol. sperim., 1937, 12, 14—16).—The urinary p_H increases (by up to >1.0) during the flight of inexperienced airmen and those of a certain psychological type.
F. O. H.

Urinary p_H as a function of fatigue in airmen. A. MANGIACAPRA (Boll. Soc. ital. Biol. sperim., 1937, 12, 17—19).—The urinary p_H decreases (by 0.2—0.8) during prolonged flights to an extent depending on the duration of flying and the personal reaction of the airmen.
F. O. H.

Incidence of non-diabetic glycosuria. B. Y. GLASSBERG (J. Lab. Clin. Med., 1935, 21, 152—156).—No relation was apparent between the blood-sugar level and the appearance of sugar in urine. In non-diabetic glycosuria blood-sugar is <0.1% and sugar is found in urine 3 hr. after ingestion of 100 g. of sucrose. In diabetics blood-sugar is >0.15% after 3 hr.
CH. ABS. (p)

Glomerular filtration and urea excretion in relation to urine flow in the dog. J. A. SHANNON (Amer. J. Physiol., 1936, 117, 206—225).—Creatinine (I) clearance is essentially const. and independent of the urine flow. At the highest flow obtainable about 40% of the urea filtered is reabsorbed, this fraction increasing as the flow decreases; the increase \propto the logarithm of the (I)/urea plasma ratio. Urea clearance shows a transient rise relative to (I) clearance during diuresis following a low urine flow; the increase is evoked by osmotic diuresis in normal or pituitrinised animals, and by H_2O diuresis in normal animals. The concept of an augmentation limit cannot be applied to urea excretion in dogs.
R. N. C.

Accuracy in the measurement of the urea excretion-constant (Ambard's constant). S. DOMBROWSKI, B. DEHYRNG, and Z. STOLZMANN (Bull. Soc. Chim. biol., 1937, 19, 466—489).—Calculations are made of the degree of precision required in measurements of urea levels in plasma and urine, and of the vol. of urine, to evaluate Ambard's const. with an accuracy of 1%. Measurements are made of the const. for young men.
E. A. H. R.

Lytic principle of urine in urinary *B. coli* [infection]. A. ALKSNIS (Compt. rend. Soc. Biol., 1935, 125, 29—31).—The principle is present in renal lithiasis and hydronephrosis or during vaccination with anacolon vaccines.
H. G. R.

Xanthurenic acid, kynurenic acid, and kynurenine.—See A., II, 305.

Origin of faecal fat in the absence of bile, studied with deuterium as an indicator. A. SHAPIRO, H. KOSTER, D. RITTENBERG, and R. SCHOENHEIMER (Amer. J. Physiol., 1936, 117, 525—528).—Fat in the faeces of patients with bile fistulae is increased during the periods when bile does not enter the intestinal tract. About 65—70% of D-containing fat added to the diet is absorbed by the intestine in absence of bile; the increase of faecal fat is due to fats secreted into the intestinal lumen.
R. N. C.

Non-specific protein therapy. R. L. CECIL (J. Amer. Med. Assoc., 1935, 105, 1846—1854).—A review.
CH. ABS. (p)

Phosphorus of blood. IV. Phosphorus partition in blood of children with disease. G. STEARNS and E. WARWEG (Amer. J. Dis. Children, 1935, 50, 1164—1172; cf. A., 1936, 1401).—In infants with tetany as also with rickets there is diminution of ester-P (I) in corpuscles and increased plasma-phosphatase. In malnutrition and osteoporosis (I) in corpuscles is decreased but to a smaller extent. In osteomyelitis (I) increases in serum and often decreases in corpuscles. Acute renal disturbance modifies all forms of P. CH. ABS. (p)

Sex differences in anæmic rats. H. H. MITCHELL and T. S. HAMILTON (Science, 1937, 85, 364—366).—Experiments involving complete control of food and supplement intake by paired rats confirm the results of Nevens and Shaw (*ibid.*, 1930, 72, 249), and show that the response of anæmic rats to metallic supplements is modified by the rate of consumption of the basal aminogenic diet so that the more the diet is consumed the slower is the regeneration of hæmoglobin. The sex difference noted by Smith and Otis (this vol., 122) may be the result of a greater intake of basal diet by male rats, and merely a sequel of the well-established difference in growth impulse between the sexes. L. S. T.

Ancylostoma anæmia. M. M. FIKRI and P. GHALIOUNGUI (Lancet, 1937, 232, 800—802).—No increase in blood vol. was found in anæmia due to infestation with ancylostoma; there may be a tendency to diminution. The glucose tolerance curves in a certain proportion of these cases showed some abnormality in the extent of the hyperglycæmic response. Blood-sugar curves after intravenous injection of glucose were normal. L. S. T.

Suitability of experimental anæmias as a test for antianæmic substances. IV. Collargol-saponin anæmia of rats as a quantitative test for injected liver preparations. P. GOTTLIBE and J. KRAUSE (Arch. exp. Path. Pharm., 1937, 184, 229—234).—The conditions are outlined for rendering suitable the collargol-saponin anæmia of rats and rabbits for evaluation of injected liver extracts. P. W. C.

Lipin and mineral distribution of serum and erythrocytes in hæmolytic and hypochromic anæmias of childhood. B. N. ERICKSON, H. H. WILLIAMS, F. C. HUMMEL, P. LEE, and I. G. MACY (J. Biol. Chem., 1937, 118, 569—598).—There is a marked rise in the neutral fat fraction of plasma-lipins in erythroblastic anæmia, whilst Cl' is normal, Na' low, and K' more variable than normal. In the erythrocytes, variations of concn. and distribution are dependent on the type of anæmia, and the resistance to hæmolysis by saponin or hypotonic aq. NaCl is related to the shape and fragility of the corpuscles. The % of EtOH-sol. phospholipins of plasma (90—95%) in hæmolytic anæmia is similar to that of normal children, but is lower (84%) in hypochromic anæmia; in hæmolytic anæmia, the phospholipins of the erythrocytes (63%) are < normal (80%). P. G. M.

Reticulocyte responses in the pigeon produced by material effective and non-effective in pernicious anæmia: histologically different re-

actions of bone marrow. G. L. MULLER (New England J. Med., 1935, 213, 1221—1226).—Injection of active liver extracts caused an increase in reticulocytes, and changes in megaloblastic bone marrow similar to those produced by treatment of pernicious anæmia. Intravenous injection of lysine or leucine causes a similar reticulocyte response, and growth and extension of erythroblastic tissue in bone marrow. CH. ABS. (p)

Lipin and mineral distribution of serum and erythrocytes in pernicious anæmia (before and after treatment). H. H. WILLIAMS, B. N. ERICKSON, S. BERNSTEIN, F. C. HUMMEL, and I. G. MACY (J. Biol. Chem., 1937, 118, 599—618).—Serum-minerals are unaffected in pernicious anæmia but the lipins contain an increased amount of neutral fat and are deficient in cholesteryl esters (I) and phospholipins (II). The erythrocytes contain an excessive amount of (I) and are deficient in free cholesterol and (II); K' and hæmoglobin are also increased. Therapy produces a return to normal vals. P. G. M.

Gastric acidity in chronic arthritis. E. F. HARTUNG and O. STEINBROCKER (Ann. Intern. Med., 1935, 9, 252—257).—Subacidity is an important factor in the chemical picture of chronic arthritis. CH. ABS. (p)

Use of helium in the treatment of asthma and obstructive lesions in the larynx and trachea. A. L. BARACH (Ann. Intern. Med., 1935, 9, 739—765).—A mixture of He 80 and O₂ 20% has $\frac{1}{3}$ the wt. of a comparable vol. of air. Inhalation of the mixture decreases pulmonary ventilation and pressure, and the length of extirpation and increases the rest period between cycles. CH. ABS. (p)

Cobalt—an essential element. (A) R. A. GORTNER. (B) H. G. DENHAM (Science, 1937, 85, 382—383, 383).—(A) A correction.

(B) The use of Co drenches giving 8 mg. of Co per week prevents and cures sheep ailment in New Zealand. The curative properties of drench materials etc. previously used with success has depended not on the Fe content but on a relatively high Co content. Purified Fe^{III} NH₄ citrate is not effective in controlling bush sickness. In New Zealand a low Co soil status is associated with stock ailment. The liver, pancreas, and blood of affected sheep contain much less Co than the corresponding organs from healthy animals. L. S. T.

Chemical factors in the ætiology of cancer. J. W. COOK (Bull. Soc. chim., 1937, [v], 4, 792—804).—A lecture.

Cancer-producing chemical compounds. C. L. HEWETT (Current Sci., 1937, 5, 527—530).—A review.

Carcinogenic action of dibenzcarbazoles. E. BOYLAND and A. M. BRUES (Proc. Roy. Soc., 1937, B, 122, 429—441).—3:4:5:6-Dibenzcarbazole (I) exhibits strong and 1:2:5:6- and (especially) 1:2:7:8-dibenzcarbazole exhibit less pronounced carcinogenic activity when painted on mice; α - and β -dinaphthylamines, *o*-aminoazotoluene, and chrysoidine exhibit no such effect. (I) produces hypertrophic biliary changes and a condition resembling hepatoma. W. McC.

Effect of polycyclic hydrocarbons on the growth rate of transplantable tumours. A. HADDOW and A. M. ROBINSON (Proc. Roy. Soc., 1937, B, 122, 442—476).—The rate of growth of Jensen sarcoma, Walker carcinoma, Rous sarcoma, and of tumours produced by carcinogenic hydrocarbons is inhibited by carcinogenic compounds (e.g., 1:2:5:6-dibenzanthracene, 3:4-benzpyrene) and by compounds such as chrysene and benzantracene derivatives which have only slight or no carcinogenic power. Certain related non-carcinogenic compounds have no inhibiting effect. The oestrogenic compound 9:10-dihydroxy-9:10-dipropyl-9:10-dihydro-1:2:5:6-dibenzanthracene has an inhibiting effect but 1-keto-1:2:3:4-tetrahydrophenanthrene has none. W. McC.

Effect of carcinogenic and other hydrocarbons on body growth in the rat. A. HADDOW, C. M. SCOTT, and J. D. SCOTT (Proc. Roy. Soc., 1937, B, 122, 477—507).—Immediate, long-continued reduction in the rate of growth of young rats is produced by intraperitoneal administration of carcinogenic (e.g., 1:2:5:6-dibenzanthracene) but not by that of non-carcinogenic hydrocarbons (e.g., pyrene). Temporary reduction in the rate is also produced by X-ray irradiation, $\text{Pb}(\text{NO}_3)_2$, and colchicine. W. McC.

Effect of 1:2:5:6-dibenzanthracene on spontaneous mouse tumours. F. C. PYBUS and E. W. MILLER (Brit. J. Exp. Path., 1937, 18, 126—137).—Evidence was obtained that the carcinogenic action of this substance is "reversible" in the same sense as that of radiation. Intraperitoneal injection of colloidal preps. caused arrest of growth in some cases and regression in others. Sarcoma and leucæmia were unaffected and the formation of new tumours was in no case prevented. R. M. M. O.

Carcinogenic action of methylcholanthrene. P. VALADE (Compt. rend., 1937, 204, 1281—1282).—Rats receiving repeated intratracheal injections of 0.1 c.c. of 0.2% methylcholanthrene in oil at intervals of 5 days showed carcinomatous growths in the trachea or oesophagus in 28% of cases. Macroscopic growths developed in 25 days to 5 months and showed, histologically, a wide variety of form. J. L. D.

Gonadotropic hormone (prolan) in relation to carcinoma of the cervix. J. A. HALSTED (New England J. Med., 1935, 213, 803—805).—In carcinoma of the cervix uncomplicated by ovarian deficiency, increased contents of the hormone appeared in the urine of 4 out of 15 cases. CH. ABS. (p)

Hyperinsulinism associated with calcified tumour of the pancreas. S. F. HERMANN and J. A. GIUS (J. Amer. Med. Assoc., 1937, 108, 1402—1405).—A case of hyperinsulinism associated with a calcareous pancreatic tumour without gross adenomatous islet tissue is described. This was cured by operative removal. H. G. R.

Cataracts and dinitrophenol. D. G. COGAN and F. C. COGAN (New England J. Med., 1935, 213, 854—856).—Cataract following use of dinitrophenol is probably caused by tissue anoxæmia leading to damaged lens epithelium. CH. ABS. (p)

Phenolsulphonephthalein in hepatic cirrhosis. G. PECO and F. I. FERREIRA (Rev. assoc. med. argentina, 1935, 49, 1265—1268).—In some cases of liver disturbance renal elimination of phenolsulphonephthalein is diminished. CH. ABS. (p)

Influence of dextrin and sucrose on growth and dermatitis. R. C. BENDER, S. ANSBAEHR, G. E. FLANIGAN, and G. C. SUPPLEE (J. Nutrition, 1936, 11, 391—400).—Basal rations containing sucrose (I) but not those containing dextrin (II) induced dermatitis in rats. Vitamin-B and lactoflavin (III) used as supplements to the (I) diet did not prevent dermatitis or permit normal growth; with the (II) ration these supplements substantially increased growth rates. Extracts of rice polishings corr. the (I) ration provided adequate amounts of -B and (III) were given. Dermatitis was delayed by addition of 10% of hydrogenated vegetable oils to the (I) diet. A. G. P.

Restoration of carbohydrate oxidation in diabetic tissue *in vitro*. E. SHORR (Science, 1937, 85, 456—458).—The respiratory quotients of excised cardiac tissue of diabetic dogs following prolonged incubation in Ringer-glucose-phosphate solution at 37.5° have been determined. With prolonged incubation under these conditions a definite change in metabolism of the tissue occurs, and the capacity to oxidise carbohydrate becomes like that of normal cardiac tissue. L. S. T.

Unusual glycogen storage in a case of diabetes mellitus. E. W. BRIAN, H. J. SCHECHTER, and E. L. PERSONS (Arch. Int. Med., 1937, 59, 685—690).—The liver contained a large amount of glycogen. R. M. M. O.

Relation of diet to goitre. III. A goitrogenic diet. R. E. REMINGTON and H. LEVINE (J. Nutrition, 1936, 11, 343—357; cf. A., 1933, 1322).—Direct correlation is established between the size and I content and between the size and dry matter content of the thyroid gland. Storage of I by rats during the first 4 weeks of life is insufficient to prevent goitre when a low-I diet is given for 5 weeks. The extent of goitre produced was not significantly affected by the Ca content or Ca:P ratio of the diet or by the presence or absence of vitamin-D. A. G. P.

Goitre and water supplies in Holland. J. F. REITH (Water, 1933, 17, 1—13).—Incidence of goitre and the I content of foods, waters, and soils are reciprocally related. Addition of 10 mg. of KI per kg. of table salt permits an intake of 30 mg. of I per year without danger of I poisoning. CH. ABS. (p)

Biochemistry of iodine. S. MIHOLIC (Bull. Soc. Chim. Yougoslav., 1936, 7, 133—140).—A correlation is established between incidence of goitre and low I content of the soil in Croatia, except for an area between the Drave and the Sava, characterised by a low I content of the soil, in which no case of goitre has been reported. R. T.

Von Gierke's glycogen disease. L. M. LINDSAY, A. ROSS, and F. W. WIGGLESWORTH (Ann. Intern. Med., 1935, 9, 274—281).—In this disease sufficient

amylase occurs in liver, blood, and urine, but appears unable to produce glucose from glycogen.

CH. ABS. (p)

Quinine test for hyperthyroidism. I. BRAM (J. Tab. Clin. Med., 1935, 21, 123—127).—Tolerance of quinine increases in hyperthyroidism to extents which \propto the basic metabolic rate. The diagnostic test is described.

CH. ABS. (p)

Icterus index in the newborn infant. B. E. BONAR (Amer. J. Dis. Children, 1935, 50, 1143—1145).—Hyperbilirubinæmia exists at birth and continues for the first 12 days irrespective of the presence of clinical jaundice. Changes in the icterus index with growth are examined.

CH. ABS. (p)

Reactions to non-specific protein treatment of infectious diseases. L. HERTOEN (J. Amer. Med. Assoc., 1935, 105, 1765—1767).—Effects of non-sp. proteins are probably due to activation of non-sp. as well as sp. anti-infectious body processes.

CH. ABS. (p)

Blood-cholesterol and -lecithin in leprosy. V. CHORINE (Compt. rend. Soc. Biol., 1937, 124, 1276—1278).—The ratio lecithin:cholesterol is >1 in infected, and <1 in healthy, rats, the increase not being parallel to the severity of the symptoms.

H. G. R.

Detection of mastitis. A. O. SHAW, H. C. HANSEN, and R. C. NUTTING (J. Dairy Sci., 1937, 20, 199—203).—Tests for hæmolytic bacteria, cell count, Cl content, and p_H showed the presence of streptococci in 92.5% of samples from cows giving abnormal milk, in 37% of samples from cows having milk chronic mastitis, and in 7.1% in normal cow's milk. The incidence of hæmolytic bacteria was 82.5, 25.0, and 1.9, and of cells $>100,000$ per ml. 87.7, 27.7, and 5.8%, respectively. Tests for Cl and p_H were unreliable.

W. L. D.

Biochemical observations in a case of progressive ossifying myositis, before and after parathyroidectomy. M. SAVIANO and C. TANGARI (Arch. Ist. Biochim. Ital., 1937, 9, 57—80).—The course of the disease was not significantly affected by parathyroidectomy.

F. O. H.

Chronic nephritis in rats fed with high-protein diets. N. R. BLATHERWICK and E. M. MEDLAR (Arch. Int. Med., 1937, 59, 572—596).—The condition was produced especially by diets with high animal protein, casein being less effective than liver or muscle. The aetiological factor may not be protein but is certainly either a substance in the food or one produced from it in metabolism.

R. M. M. O.

Carbohydrate metabolism in pregnancy. B. J. MORA GUES (Día méd., 1934, 6, 497).—In pregnancy there are factors which modify normal glucoregulation and which differ from those observed in non-pregnant conditions. Marked hypoglycæmia is due to latent or apparent hepatic insufficiency.

CH. ABS. (p)

Habitual abortion and stillbirth syndrome and late pregnancy toxæmia. Vitamin-E and the prolan-progesterone mechanism. J. YOUNG (Brit. Med. J., 1937, 953—957).—The syndrome is discussed in relation to vitamin-E and the prolan-

progesterone mechanism in pregnancy. Results of prolan therapy are recorded.

A. G. P.

Blood-urea in experimental rabies in the dog and rabbit. P. REMLINGER and J. BAILLY (Compt. rend. Soc. Biol., 1937, 125, 220—222).—An increased val., reaching a max. at death, was observed.

H. G. R.

Healing of rickets in rats on a diet containing negligible amounts of calcium and vitamin-D. J. H. JONES and B. N. E. COHN (J. Nutrition, 1936, 11, 293—302).—Rachitic rats transferred to a diet containing adequate P but only traces of Ca and vitamin-D showed, after an initial period of disturbance, healing of rachitic lesions and a slight increase in femur ash. Ca and bone salts were probably transferred from calcified to rachitic parts of the skeleton. This process was unaffected by supplementary feeding of irradiated ergosterol.

A. G. P.

Influence of parasitism on the mineral equilibrium of the tissues (sacculine in crabs). A. DRILHON (Compt. rend., 1937, 204, 913—915; cf. A., 1936, 876).—The Ca and Mg contents of the claw muscles of crabs (*Carcinus maenas*) are about 4 and 3 times as great respectively in sacculinised as in normal crabs; K and Na remain unchanged. In the parasite itself, the % of Ca is similar to, and that of Mg, K, and Na $>$, that in normal crabs.

F. A. A.

Dosage of moranyl in treatment of gambiense sleeping sickness. A. SICE and H. MERCIER (Trop. Dis. Bull., 1935, 32, 21—22).—Oral or intravenous administration of moranyl (I) produced a degree of sterilisation similar to that obtained with orsanine but caused marked albuminuria. Combined use of (I) and tryparsamide gave better results than either alone.

CH. ABS. (p)

Derivatives of *p*-aminobenzenesulphonamide in the treatment of streptococcal infection in mice.—See A., II, 302.

Tetany of œstrus in the parathyroidectomised dog. E. I. EVANS, S. SZUREK, and R. KERN (Amer. J. Physiol., 1936, 117, 405—410).—Ca, PO_4 , Na, K, Cl, CO_2 , and p_H show no apparent change in the blood of normal bitches during the œstrus cycle. Tetany may occur in a parathyroidectomised bitch coming into natural œstrus in the latent tetany period if serum-Ca is low or comparatively normal.

R. N. C.

Nature of the resistance to treatment shown by some cases of bovine trypanosomiasis. H. E. HORNBY (Tanganyika Ann. Rep. Dept. Vet. Sci., 1934, 37—39).—In treatment of *T. congolese* infection with Sb compounds it is unlikely that Sb reaches and kills all trypanosomes in the body. Complete sterilisation depends on subsequent antibody action. Refractoriness to treatment results from failure of the host to produce the antibody rather than to special resistance of the parasite to the drug.

CH. ABS. (p)

Nitrogen and mineral metabolism in *Trypanosoma congolese* disease. M. H. FRENCH (Tanganyika Ann. Rep. Dept. Vet. Sci., 1934, 59—64).—Infection of cattle with *T. congolese* increases the rate of

excretion of N, Ca, K, and P, but not of Mg. The effects on Na and Cl metabolism depend on the level of intake. Pica developing during the disease represents an attempt to correct excessive loss of minerals and to neutralise the resulting acidosis.

CH. ABS. (p)

Mechanism of healing in collapse therapy. M. PINNER (Ann. Intern. Med., 1935, 9, 501—515).—Reduced O_2 - and increased CO_2 -tension may produce conditions unfavourable to the tubercle bacillus.

CH. ABS. (p)

Chemotherapy of tuberculosis. H. SCHLOSS-BERGER (Angew. Chem., 1937, 50, 407—409).—In tuberculosis, chemotherapeutic agents probably act wholly directly or partly directly, partly by stimulation of the defensive mechanism of the infected organism. Those org. Au compounds which sometimes have beneficial effects probably weaken but do not kill the bacilli and hence require the co-operation of this mechanism.

W. McC.

(A) **Variations in the blood-sugar and glycogen reserves during experimental uræmia in the rabbit.** M. VILLARET, L. JUSTIN-BESANÇON, A. RUBENS-DUVAL, and P. BARBIER. (B) F. RATHERY (Compt. rend. Soc. Biol., 1937, 125, 266—268, 268—269).—(A) Free sugar (I) rises slightly and then returns to normal, whereas protein-bound (I) rises progressively with a consequent decrease in hepatic and muscular glycogen reserves.

(B) Previous work (A., 1931, 1181) utilising the dog confirms these results except that variations in the free (I) were irregular.

H. G. R.

Adequacy of the chemical theory of smooth muscle excitation. A. ROSENBLUETH and W. B. CANNON (Amer. J. Physiol., 1936, 116, 414—429).

R. N. C.

Chemical activity of nerves. (A) Q. CALABRO. (B) G. BERGAMI (Arch. Ist. Biochim. Ital., 1937, 9, 99—104, 105—119).—(A) The conclusions of Bergami and collaborators (cf. A., 1936, 1413; this vol., 178) are criticised.

(B) A reply. Further evidence for the author's theory is given.

F. O. H.

Pancreas and general metabolism. W. N. BOLDYREFF (Amer. J. Digest. Dis. Nutrition, 1935, 2, 413—415).—Pancreatic enzymes control the carbohydrate, fat, and protein metabolism of the whole body and of each individual cell. There is evidence that the pancreas is the principal agent in all general chemical processes of the organism.

CH. ABS. (p)

Technique for metabolism studies in pre-school children: statistical determination of its reliability. J. E. HAWKS, M. DYE, and M. M. BRAY (J. Nutrition, 1937, 13, 51—64).—The method is described and the range of variation in composition of prepared experimental diets is determined.

A. G. P.

Basal metabolism of Wyoming University women. E. J. MCKITTRICK (J. Nutrition, 1936, 11, 319—325).—Living at high altitudes (7000 ft.) raises the level of basal metabolism.

A. G. P.

Blood-cholesterol in disturbances of the basal metabolic rate. L. C. MCGEE (Ann. Intern. Med.,

1935, 9, 728—738).—No correlation was apparent between blood-cholesterol (I) and basal metabolic rate or the condition of the patient. Thyroid disease is accompanied by changes in (I), and determinations in plasma may be of val. in following the progress of treatment.

CH. ABS. (p)

Specific dynamic action of protein and ammonia production using the isolated kidney. K. OBERDISSE and M. ECKARDT (Arch. exp. Path. Pharm., 1937, 184, 109—125).—When alanine (I) is administered to the isolated dog's kidney prep. 79% increase in O_2 utilisation occurs and with glycine 38.9% increase. A small amount of (I) is excreted in the urine and part is deaminated, the NH_3 production with (I) increasing by 14 times. $AcCO_2H$ causes an increase of 80% in O_2 utilisation. Deamination has no importance, therefore, in respect of the sp. dynamic effect. About 24% of the sp. dynamic effect of NH_2 -acids in the whole animal is due to the two kidneys.

P. W. C.

Respiratory metabolism in infancy and childhood. XVI. **Effect of intravenous infusions of fat on the energy exchange of infants.** H. GORDON and S. Z. LEVINE (Amer. J. Dis. Children, 1935, 50, 894—912).—Parenterally administered fats can be oxidised in normal infants if the control level of the R.Q. is 0.9—1.0. Intravenous administration of emulsified fats depressed the R.Q. by 0.03—0.07. Increased heat production due solely to increased fat oxidation occurred. With R.Q. = 0.8 fat oxidation was not increased even if emulsified fat was given orally. Parenterally administered fat had no effect on the R.Q. of the marasmic infant.

CH. ABS. (p)

Blood-flow and gaseous metabolism of the liver of unanæsthetised dogs. A. BLALOCK and M. F. MASON (Amer. J. Physiol., 1936, 117, 328—334).

R. N. C.

Effect of aggregation on the respiratory metabolism of the brown snake *Storeria dekayi*. H. J. CLAUSEN [with B. MOFSHIN] (J. Cell. Comp. Physiol., 1936, 8, 367—386).— O_2 consumption was lower in aggregated than in isolated snakes. Throughout the year vals. for males were > for females. O_2 consumption per unit wt. in gravid females diminished prior to, and increased sharply after, parturition.

M. A. B.

Respiration of embryo versus egg (Orthoptera). J. H. BODINE and E. J. BOELL (J. Cell. Comp. Physiol., 1936, 8, 357—366).—During diapause and throughout the first 9 days of development the rate of O_2 consumption is lower in the embryo than in the whole egg, so that data for the intact egg are not applicable to the contained embryo.

M. A. B.

Rate of tissue metabolism of marine cold-blooded animals in different latitudes. H. M. FOX and C. A. WINGFIELD (Nature, 1937, 139, 369; cf. A., 1936, 884).—Measurements of the O_2 consumption of isolated muscles of prawns from different latitudes support, in certain cases, the hypothesis that the greater O_2 requirement of English compared with arctic invertebrates, each at the temp. of its habitat, is due to a greater non-locomotory metabolism.

L. S. T.

Milk and nutrition.—See B., 1937, 610.

Effect of feeding egg-yolk on liver-lipins of young rats. R. OKEY and E. YOKELA (J. Nutrition, 1936, 11, 463—470).—Rats receiving a diet containing egg-yolk sufficient to provide 1% of cholesterol (I), tended to develop fatty livers although the diet contained 2.3% of phospholipins. In females receiving such a diet the accumulation of fat and cholesterol esters was > in those receiving egg-yolk protein, the same level of cholesterol as hydrogenated vegetable oil, but no lecithin. Males store less liver fat and (I) on egg-yolk than on (I)-containing diets.

A. G. P.

Comparative effects of cod-liver oil, cod-liver oil concentrate, lard, and cottonseed oil in a synthetic diet on development of nutritional muscular dystrophy. L. L. MADSEN (J. Nutrition, 1936, 11, 471—493).—A basal diet free from fat except the non-saponifiable fraction of cod-liver oil used as a source of vitamin, produced dystrophy to nearly the same extent as the basal diet + 6% of lard. Substitution of cottonseed oil for lard afforded a high degree of protection. Nutritional muscular dystrophy in guinea-pig and rabbit is similar and is characterised by a diminution in creatine and a somewhat increased O_2 consumption of the excised muscle tissue.

A. G. P.

Nencki's hæmatoporphyrin. W. HACKER with J. HÜNNERFELD (Arch. exp. Path. Pharm., 1937, 184, 723—736).—The hæmatoporphyrin given to man either by mouth or intramuscularly enters the blood stream only in small amounts (<10⁻⁵%) and is excreted in the fæces to a considerable extent.

P. W. C.

Biological value of hydrolysed blood-proteins. V. MARTINI (Boll. Soc. ital. Biol. sperim., 1937, 12, 23—24).—Oral administration of hydrolysed (H_2SO_4) serum-proteins (ox) to dogs is accompanied by a negative N balance; intravenously administered, the utilisation is lower. The addition of small amounts of tryptophan also gives a negative balance but increases the biological val. of the hydrolysate.

F. O. H.

"Reconstructive value" of purified proteins. I, II. Feeding of rats with ovalbumin, caseinogen, gliadin, and gelatin. L. CIOLLIA (Boll. Soc. ital. Biol. sperim., 1936, 11, 1034—1035, 1035—1036).—I. With diets deficient only in protein, recuperative growth in fasted rats results from daily addition to the diet of <1.6 g. of ovalbumin or caseinogen or 2.4 g. of gliadin whilst 2.4 g. of gelatin does not produce normal growth.

II. The above effect is also shown by the N balance.

F. O. H.

Urea clearance and protein clearance during exercise. A. B. LIGHT and C. R. WARREN (Amer. J. Physiol., 1936, 117, 658—661).—Urea clearance in normal young males shows a fall during regulation games; it is independent of the degree of proteinuria, and shows no significant difference according to the nature of the sport.

R. N. C.

Relation of experimental atherosclerosis to diets rich in vegetable protein. R. H. FREYBERG (Arch. Int. Med., 1937, 59, 660—666).—In rabbits

diets rich in vegetable protein do not cause either atherosclerosis or hypercholesterolaemia; the latter, however, arises from under-nutrition. The apparent influence of animal protein may thus be due to some accompanying substance.

R. M. M. O.

Metabolism of glyoxaline. IV. Glyoxalinuria in exogenous protein metabolism. P. LELU (Bull. Soc. Chim. biol., 1937, 19, 490—495; cf. this vol., 129).—After a protein-rich meal, the initial rise in urinary glyoxaline (I) is relatively > that of total N. The rise in total N persists longer than that of (I), which, after reaching a max., falls rapidly to its original level. Histidine (II) must therefore be detached early in the course of the digestive degradation of proteins. As the (I) level is highest when the coeff. of oxidation of proteins is lowest, it is concluded that (II) has a greater resistance to deamination than other NH_2 -acids.

E. A. H. R.

Effect of methylene-blue, cystine, and cysteine on the metabolism of the intact animal. W. GOLDFARB, J. F. FAZIKAS, and H. E. HEMWICH (Amer. J. Physiol., 1936, 117, 631—637).—The R.Q. in rats shows an initial depression, later rises to vals. > the original val., and then returns to the post-absorptive level.

R. N. C.

Nature of the compounds excreted as a result of the catabolism of the amino-acids. G. MOUROT (Compt. rend., 1937, 204, 915—917).—Data are given for the effect of 14 NH_2 -acids and NH_4 citrate, fed singly as supplements to rats on a carbohydrate diet, on the amounts of various urinary N compounds. The main effect is to increase urea-, NH_3 -, and NH_2 -N. No effect is produced on the excretion of purine or creatinine derivatives; variations in the amounts of creatine are small and irregular.

F. A. A.

Blood clearance and renal excretion of bile acids following intravenous injection of cholic and deoxycholic acids. S. S. LIGHTMAN (Amer. J. Physiol., 1936, 117, 665—671).—Cholic acid (I) injected into dogs is promptly removed from the blood, but deoxycholic acid (II) persists for 2 hr. Urinary excretion of bile acids (III) after injection of (I) is > after (II), but only a small fraction of the injected dose is excreted in either case. If the dose of (II) is restricted, (III) may not be excreted in the urine, but blood-(III) are increased. The blood/urinary (III) ratio, when the concn. in either fluid is increased following injection, may acquire a sp. const. val. according as (I) or (II) is injected.

R. N. C.

Mechanism of the biological synthesis of acetylcholine. I. Isolation of acetylcholine produced by brain tissue *in vitro*. EDGAR STEDMAN and ELLEN STEDMAN (Biochem. J., 1937, 31, 817—827).—When minced brain was incubated at 37° in the presence of eserine, acetylcholine (I) was formed. The yield of (I) was increased by a preliminary grinding of the tissue with $CHCl_3$. (I) was isolated as the double platinichloride of choline and (I), from which (I) aurichloride was subsequently prepared. $CH_3Ac \cdot CO_2Na$ increased the yield of (I) by 50% and may therefore be a possible precursor of the Ac of (I). $AcOH$ and $AcCO_2H$ are not precursors.

E. A. H. R.

Oxidation of choline by rat's liver. P. J. G. MANN and J. H. QUASTEL (*Biochem. J.*, 1937, 31, 869—878).—The increase in O_2 uptake following addition of choline (I) to respiring tissue slices is accompanied by disappearance of the (I) and is reversibly inhibited by CN' . Effects of varying the concn. of (I) and CN' are described. The oxidation product is probably betainealdehyde (isolated as reineckate and aurichloride), further oxidation with Ag_2O or $KMnO_4$ giving betaine.
R. M. M. O.

Effect of quantitative underfeeding and of vitamin-A deficiency on tissue lipins of rats fed diets low in cholesterol. H. L. GILLUM and R. OKEY (*J. Nutrition*, 1936, 11, 303—317).—The size and fatty acid content of livers of rats receiving vitamin-A-deficient diets or insufficient nourishment but with adequate -A supplies were < those of control animals. Livers of undernourished animals contained relatively more free cholesterol (I). Diets low in (I), lecithin, and fat produced low cholesteryl ester (II) concns. in all cases. Subsequent feeding of (I) produced (i) lower % and abs. storage of (II), and a slightly lower phospholipin content in livers of -A-deficient animals, (ii) higher concns. and nearly as high abs. amounts of (II) in the small livers of undernourished rats as in the grossly enlarged livers of control animals.
A. G. P.

Effect of administration of squalene and other hydrocarbons on cholesterol metabolism in the rat. H. J. CHANNON and G. R. TRISTRAM (*Biochem. J.*, 1937, 31, 738—747).—When a diet containing 1% of squalene (I) is administered to rats, the mean increases of liver- and faeces-sterol are 50 and 33%, respectively [the sum representing 1/8 of the (I) given], with no change in carcass-sterol. The liver-sterol increase is in esterified cholesterol (II). When partly hydrogenated (I) is administered, little absorption occurs and the faecal, but not the liver-, sterol is increased. The same result, however, is obtained on feeding *n*-hexadecane, suggesting that the increase is due to unabsorbed hydrocarbon passing through the intestine. The effects of the hydrocarbons are probably not entirely due to solvent action but it appears that they either cause increased production of (II) or interfere with its absorption. (I) administered to captive cod appears in the liver but does not cause an increase in liver-sterol. No definite conclusion is possible but the balance of evidence suggests that (I) is not converted into (II).
P. W. C.

Fat metabolism. X. Fate of triglycerides of saturated monobasic acids in dogs. P. E. VERKADE, J. VAN DER LEE, and A. J. S. VAN ALPHEN (*Z. physiol. Chem.*, 1937, 247, 111—114; cf. *A.*, 1934, 441; 1936, 234).—The feeding of the triglycerides of the acids C_7 — C_{11} to a dog resulted in the appearance in the urine of appreciable amounts of dicarboxylic acids only in the case of the C_8 acid (cf. Flaschenträger and Bernhard, *A.*, 1936, 510).
W. McC.

Fat metabolism in fishes. XI. Specific peculiarities in depôt fat composition. J. A. LOVERN (*Biochem. J.*, 1937, 31, 755—763; cf. *A.*, 1936, 1544).—The differences between fats of

fresh-water and marine species are expressed graphically, indicating the probable average unsaturation of fats ingested by most species. The fats show sp. peculiarities in the degree of unsaturation of one or more of the acid groups, in the proportions of their acids (*e.g.*, acids of lower mol. wt. being suppressed or increased), in the content of a particular acid, or in a neutralisation effect due to the animal's habit of both sea- and fresh-water feeding. Examples are given.
P. W. C.

Is the alimentary unbalance caused by fatty acids of high m.p. (above 50°) of the same order as that produced by liquid fatty acids at body temperature? R. LECOQ (*Compt. rend.*, 1937, 204, 1001—1003; cf. *A.*, 1935, 1015; 1934, 687; 1933, 872).—Mixed fatty acids (stearic 50, palmitic 40, and oleic acid 10%) (22 parts) or their K salts, in a diet containing in addition muscle-peptone 59, butter fat 4, salt mixture 5, agar and filter-paper 10 parts, when fed to pigeons does not protect against polyneuritis even when a daily dose of 3 g. of dried yeast is administered. 2% of glycerol in the diet somewhat ameliorates the condition. Disturbance caused by feeding solid acids is similar to that by liquid acids and is probably due to formation of rapidly assimilable soaps in the intestines.
J. L. D.

Effect of cellulose, hemicellulose, and lignin on the weight of the stools. R. D. WILLIAMS and W. H. OLMSTED [with C. H. HAMANN, J. A. FIORITO, and D. DUCKLES] (*J. Nutrition*, 1936, 11, 433—449).—During passage through the digestive tract, the relative decomp. of hemicellulose (I), cellulose (II), and lignin (III) decreased in the order named. The vol. of faeces was influenced by the amount of (I) and (II) decomposed in the tract > by the amount of residue [(I) + (II) + (III)] fed or the amount present in the faeces. High proportions of volatile fatty acids in faeces are associated with extensive decomp. of (I) and (II).
A. G. P.

Utilisation of fructose in the mammalian organism as shown by experiments on hepatectomised and eviscerated preparations. J. P. GRIFFITHS and E. T. WATERS (*Amer. J. Physiol.*, 1936, 117, 134—141).—Fructose (I) is utilised and can prolong life in dogs deprived of their liver and viscera. Injection of a large quantity of (I) is not followed by an increase in blood-glucose, showing that (I) can be oxidised directly by tissues, without previous conversion into glucose.
R. N. C.

Speed of absorption following the ingestion of glucose and of sucrose. A. C. ROBERTS (*Amer. J. Physiol.*, 1936, 117, 257—260).—Blood-sugar in dogs after ingestion of glucose tends to be > after sucrose, possibly through more rapid absorption.
R. N. C.

Utilisation of hexoses by excised rat tissues. M. E. MARSH (*J. Nutrition*, 1937, 13, 109—112).—Addition of fructose (I) to Ringer phosphate solution increased the O_2 consumption and R.Q. of kidney tissue placed therein. Glucose (II) produced a smaller and galactose (III) no effect. Muscle tissue oxidised neither (I) nor (II). Liver tissue did not oxidise (II) or (III) but acted on (I), although in this

case other processes than oxidation (possibly conversion into fat) are probably concerned. A. G. P.

Utilisation and tolerance of the monosaccharides. J. GARCIA-BLANCO (Día méd., 1934, 6, 1099).—Fructose, galactose, and mannose are converted into glucose (I) before utilisation. (I) appears in urine soon after its circulation in blood. Xylose is absorbed slowly, its hepatic retention is very low, its utilisation small, and its elimination by the liver easy. CH. ABS. (p)

Chemical processes during contraction of muscle under high pressure. H. J. DEUTICKE and U. EBBECKE (Z. physiol. Chem., 1937, 247, 79—103).—Transformations occurring during the contraction of the frog gastrocnemius suspended in oil and exposed for 2 sec. to 40 min. to pressures of 300—1500 atm. are the same as those which occur in untreated muscle but vary in extent with the magnitude and duration of the pressure. Pressure of 300 atm. accelerates and extends decomp. of phosphocreatine (I) but only slowly affects the glycogen, lactic acid (II), and inorg. PO_4''' contents. Pressure of 500 atm. greatly accelerates (I) decomp. and increases (II) production. Lengthy exposure to pressure causes decomp. of $\text{P}_2\text{O}_7'''$. Synthesis of hexose monophosphate in the exposed muscle begins early, reaches its max. very slowly, and is detected even after exposure to pressure has been of such duration that irreversible damage to the muscle has occurred. W. McC.

Acid-soluble phosphates of muscle following injection of glucose plus insulin. G. T. CORI and C. F. CORI (Proc. Soc. Exp. Biol. Med., 1937, 36, 23—27).—Following injection of glucose + insulin, serum- PO_4''' increases, but no change in org. acid-sol. P of muscle occurs. P. G. M.

Phosphorylation in kidney tissue. H. KALCKAR (Enzymologia, 1937, 2, 47—52; cf. A., 1936, 1420).—Kidney cortex phosphorylates large amounts of glucose (I) after inhibition of dephosphorylation by F^- . Phosphorylation is reversibly inhibited under anaerobic conditions, suggesting a coupled reaction between the phosphorylation and the O_2 consumption. 1 mol. of P reacts with (I) for each mol. of O_2 absorbed. CN^- inhibits phosphorylation and respiration equally but phloretin and $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$ have a greater effect on phosphorylation. The phosphorylation product is fructose diphosphate and the O_2 consumption is independent of phosphorylation. A similar accumulation of phosphoric esters occurs in liver tissue poisoned with F^- . E. A. H. R.

Oxidation of β -hydroxybutyric acid in the kidneys. A. ROSSI (Boll. Soc. ital. Biol. speriment., 1937, 12, 10—11).—In presence of slices of surviving kidney (guinea-pig, rat), the acid is oxidised (optimum p_{H} 7.2—7.3) but to an extent $<$ that for $\text{CH}_3\text{Ac}\cdot\text{CO}_2\text{H}$ (I) (cf. this vol., 174). Neither (I) nor COME_2 is produced. F. O. H.

Acetopyruvic acid ($\alpha\gamma$ -diketovaleric acid) as an intermediate metabolite in animal tissues. H. A. KREBS and W. A. JOHNSON (Biochem. J., 1937, 31, 772—779).— $\alpha\gamma$ -Diketo-*n*-valeric acid (I) is metabolised by liver, muscle, kidney, testes, and S (A., III.)

brain (rat, pigeon), $\text{CH}_3\text{Ac}\cdot\text{CO}_2\text{H}$ being formed under aerobic, and β -hydroxybutyric acid under anaerobic, conditions. Ketones are formed more rapidly from (I) than from AcOH or AcCO_2H , indicating that (I) may be an intermediary in the synthesis of ketones from these acids. P. W. C.

Physiological and biochemical significance of oxidation of ethyl alcohol in the organism. E. LE BRETON (Bull. Soc. Chim. biol., 1937, 19, 17—43).—A lecture.

Diffusion of ethyl alcohol in marine animals, and the bound-water hypothesis. M. NICLOUX (Compt. rend., 1937, 204, 832—834).—The val. of the coeff. *K* (see A., 1934, 1021) is low, averaging 1.15, for the ten different species of marine animals examined, but rising to ~ 1.5 when these animals are placed in fresh H_2O . This is parallel to the decrease in val. from 1.5 to 1.1 when fresh- H_2O creatures are placed in sea- H_2O . F. A. A.

Path of urea in the kidney of *Salamandra maculosa*. Laur. J. GICKLEHORN (Protoplasma, 1936, 26, 70—89).—Using the xanthhydrol reaction to demonstrate the presence of urea (I), it is shown that (I) passes from the glomerular capillaries into the Bowman's capsules without change in concn. and that the urine is then conc. by re-absorption of H_2O as it passes down the tubuli contorti. There is no evidence that (I) is secreted by the epithelial cells of the tubuli contorti. M. A. B.

Influence of dietary inorganic salts on the ash of rat's tissues. E. S. EPPRIGHT and A. H. SMITH (J. Biol. Chem., 1937, 118, 679—692).—The influence of inorg. components on the ash of various tissues is examined and discussed. Muscle-K:Na ratio is dependent on dietary Ca, whilst Cl is more directly related to dietary Cl. R. M. M. O.

Utilisation of energy-producing nutriment and protein as affected by sodium deficiency. O. J. KAHLENBERG, A. BLACK, and E. B. FORBES (J. Nutrition, 1937, 13, 97—108).—Insufficiency of dietary Na adversely affected appetite, live-wt. increase, energy storage, and synthesis of fat and protein in rats. The digestibility of protein and the metabolisability of energy foods were unaffected but heat loss was increased. Na-containing diets increased Na retention and improved growth.

A. G. P.

Exchanges between blood-plasma and tissue-fluid in man. A. KEYS (Science, 1937, 85, 317—318).—After violent exercise, [Na] in the plasma is 2—10% $>$ the resting level but returns to normal in 15 min., at which time the return of H_2O is $>75\%$ complete. The rate of exchange of Na across the capillary wall is apparently much $<$ that of H_2O , but is still rapid in comparison with the readjustment of the blood vol. The behaviour of the plasma-K is much more complex. The exchanges of Na^+ , Ca^{++} , H_2O , protein, and possibly SO_4''' and Cl^- , can readily be interpreted in terms of osmosis and different rates of diffusion through the capillary walls, but such explanations are inadequate for the K⁺ exchanges.

L. S. T.

Potential alkalinity of honey: its acid-base value as a food. R. E. LORRUP (J. Nutrition, 1936, 11, 511—514).—Eleven samples of honey examined by the Davidson-Le Clerc method (A., 1935, 554) showed an average alkaline val. of 1.5. A. G. P.

Utilisation by the organism of various calcium salts administered by mouth. F. SCHMITT and W. BASSE (Arch. exp. Path. Pharm., 1937, 184, 538—540).—A table summarises the amounts of Ca given by mouth as the phosphate, acetate (I), or gluconate (II) and the amounts excreted in urine and faeces. The amount utilised when given as (II) and (I) was 66% and 31.5—59.5%, respectively, of the intake. (II) given intravenously is but little utilised.

P. W. C.

Use of three-day periods in human metabolism studies. Calcium and phosphorus. S. I. PYLE and C. E. HUFF [with R. DAVIS] (J. Nutrition, 1936, 11, 495—509).—A 3-day balance period with a 24-hr. sampling on the third day is used for determining the utilisation of Ca and P during pregnancy.

A. G. P.

Relation between calcium retention and the store of calcium in the body, with particular reference to the determination of calcium requirements. B. W. FAIRBANKS and H. H. MITCHELL (J. Nutrition, 1936, 11, 551—572).—The Ca content of growing rats is dependent on that of the diet (if < the requirement for max. storage) and is inversely related to the rate of growth. Low levels of dietary Ca may retard growth during the consumption of the deficient diet and subsequently during adequate Ca nutrition. There is no Ca requirement for maintenance of the growing animal. Differences in the degree of Ca saturation of skeletal tissues in rats caused by previous feeding of different levels of Ca produce irregularities in Ca retention when dietary Ca is maintained at a uniform level. Previous low saturation with Ca is associated with subsequent high retention, on adequate diets. The bearing of these results on nutritional experiments is discussed.

A. G. P.

Magnesium requirements of pre-school children. A. L. DANIELS and G. J. EVERSON [with M. F. DEARDORFF, E. M. KNOTT, F. I. SCULAR, and O. E. WRIGHT] (J. Nutrition, 1936, 11, 327—341).—Diets of children of 4—7 years should contain < 13 mg. of Mg per kg. body-wt. Retention of Mg was unrelated to the amount of Ca ingested or retained. Variations in ingested Mg were paralleled by those in urinary Mg. In 75% of cases examined ingestion of generous amounts of Mg was followed by high retention and high elimination of Mg in urine.

A. G. P.

Retention and utilisation of orally administered iron. W. M. FOWLER and A. P. BARER (Arch. Int. Med., 1937, 59, 561—571).—When Fe is given in large doses in treatment of hypochromic anaemia about 30% is retained in the body, but only about 2% is utilised to form haemoglobin.

R. M. M. O.

Iron metabolism of normal young women during consecutive menstrual cycles. R. M. LEVERTON and L. J. ROBERTS (J. Nutrition, 1937, 13, 65—95).—Fe balances are recorded for periods

covering 4—5 menstrual cycles. The optimum Fe requirement is 16—17 mg. daily for a 56-kg. woman. Low haemoglobin vals., often accepted as normal in women, result from insufficient dietary Fe rather than from menstrual losses.

A. G. P.

Active absorption of anions in the animal kingdom. A. KROGH (Nature, 1937, 139, 755).—It is suggested that a mechanism closely resembling that demonstrated by Lundegårdh for plants is of widespread occurrence and of considerable biological significance in animals.

L. S. T.

Excretion of bromide, iodide, and thiocyanate by the perfused frog kidney. E. P. LAUG and R. HÖBER (J. Cell. Comp. Physiol., 1936, 8, 347—356).—The frog kidney perfused with Ringer solution concentrates CNS' by secretory activity of the tubules, dilutes Br' by reabsorptive activity of the tubules, but reacts indifferently towards I'.

M. A. B.

Metabolism of ammonia in sea urchin's eggs. Å. ÖRSTRÖM (Naturwiss., 1937, 25, 300—301).—From observations on the NH₃ metabolism of fertilised and unfertilised sea urchin's eggs it is concluded that NH₃ derived from the oxidation of NH₂-acids is fixed by some substance of unknown nature. In unfertilised eggs fixation of NH₃ is slow, while its formation is relatively rapid. After fertilisation an NH₃-fixing substance (I) is formed and the NH₃ formed by oxidation is removed. Addition of NH₄ salts promotes fixation of NH₃. As the fixation of NH₃ is dependent on the respiration, it is inhibited under anaerobic conditions. (I) in fertilised eggs can be replaced in unfertilised eggs by certain NH₂-acids and this leads to nuclear growth and division. The appearance of (I) is probably coupled with chromosome formation.

E. A. H. R.

Rate of "organification" of phosphorus in animal tissues. C. ARTOM, G. SARZANA, C. PERRIER, M. SANTANGELO, and E. SEGRÉ (Nature, 1937, 139, 836—837).—Using ³²P as indicator, the relative amounts of inorg. P (Na phosphate) taken up by different organs when injected into young rats have been determined. Subsequent analysis shows the presence of radioactive lipin-P in liver, intestine, and kidney in amounts ≫ in muscle or brain. This indicates that the participation of the phospholipins results, at least in part, in a complete synthesis starting from inorg. P.

L. S. T.

Action of radium rays on the growth of cells in vitro. L. HALBERSTÄDTER and L. DOLJANSKI (Nature, 1937, 139, 841—842).—By irradiating chick's mesenchyme cells *in vitro* and held at 6° so that active cell life is inhibited, and then allowing the cultures to develop, the amount of growth inhibition and the dose of rays applied have been correlated.

L. S. T.

Geiger-Müller counter for detecting small amounts of radium stored in radium workers. E. O. BRAATEN and J. D. LEITCH (J. Ind. Hyg., 1937, 19, 193—197).—A portable instrument is described and data for 9 individuals are recorded.

J. G. A. G.

Production of sympathin in response to physiological stimuli in the unanæsthetised

animal. P. P. PARTINGTON (Amer. J. Physiol., 1936, 117, 55—58). R. N. C.

Models for the stimulation of the organ of smell. H. G. B. DE JONG and G. G. P. SAUBERT (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 302—306).—Tentative models (coacervate systems) are suggested representing the mechanism of the stimulation of smell, assuming that the mols. of the odorous substance penetrate into a certain substratum of cells of the nose and cause a reversible change in condition. J. W. S.

Osmotic pressure of organs. II. Osmotic pressure of the kidney, blood, and urine following intravenous injection of water or hyper- and hypo-tonic solutions of pharmaceutical substances. I. SIMON (Arch. Farm. sperim., 1937, 63, 1—46).—The osmotic pressure of the blood (rabbit) increases with hyper- and remains unchanged with iso- and hypo-tonic solutions; that of the kidney and, to a greater extent, that of the urine always (with few exceptions) diminish. The mechanism of these changes is discussed. F. O. H.

Physico-chemical conditions of the bursting and dehiscence of the spermatophores of some cephalopods. M. ROSE and M. HAMON (Compt. rend., 1937, 204, 898—900).—In cephalopods, the "Needham pocket," in which the spermatophores are held after formation, is distinctly acid, the p_H varying from 5.8 at the bottom to 6.2 at the top. The effects of placing the spermatophores in sea- H_2O , fresh H_2O , isotonic glucose solution, and various salt solutions are described; these effects are complex, and vary with the species, and with the original situation of the spermatophores in the pocket. F. A. A.

Growth of tissue cultures in heavy water. A. FISCHER (Protoplasma, 1936, 26, 51—55).— D_2O in concn. <20—25% has no adverse effect on fowl heart fibroblasts. Above 20—25% the adverse effect increases linearly up to 100%, when growth is entirely suppressed. The adverse effect is reversible. Growth of mouse carcinoma is completely suppressed in 50% D_2O . Rous fowl sarcoma showed depression of both cell growth and proteolytic decomp. of the plasma clot in 70% D_2O . M. A. B.

Comparison of the inhibitory action of cations on dispersion of the cell aggregates in the sponge, *Haliciona*. W. E. BRADWAY (Protoplasma, 1936, 25, 546—549).—With isotonic urea at p_H 8 as dispersing agent the different cations showed the following relative inhibiting powers: K^+ 1.00, Cs^+ 1.02, NH_4^+ 1.03, Li^+ 1.25, Rb^+ 1.25, Na^+ 1.60, Sr^{++} 9.75, Ba^{++} 17.78, Ca^{++} 23.46, Mg^{++} 49.70. M. A. B.

Action on metabolism of Karlsbad mineral waters. A. KERN and E. STRANSKY (Arch. exp. Path. Pharm., 1937, 184, 170—180).—Administration of Karlsbad spring water to young and to adult rabbits and guinea-pigs for 4 weeks increased the liver-glycogen in 50% and activated liver amylase in over 30% of the animals. The effect is not obtained with rats. The liver contents of fat, reduced glutathione, lipase, and phosphatase were unaffected. P. W. C.

Absorption of sodium chloride from the small intestine at various degrees of anoxæmia. E. J. VAN LIERE and C. K. SLEETH (Amer. J. Physiol., 1936, 117, 309—312).—Absorption of 0.9% NaCl in dogs and cats is decreased by low O_2 tensions. Fluid absorption and NaCl absorption run parallel. There is an apparent min. absorption at 8.35—10.56% O_2 . R. N. C.

Effects of sodium fluoride administration on the basal metabolic rate of experimental animals. P. H. PHILLIPS (Amer. J. Physiol., 1936, 117, 155—159).—NaF does not affect the metabolic rate in normal animals, but increases it in scurvy or during sensitisation by desiccated thyroid (I). The falls in body-wt. produced by NaF and (I) in rats are parallel. R. N. C.

Action of calcium on the isolated frog's heart. G. ORZECOWSKI (Arch. exp. Path. Pharm., 1937, 184, 694—701).—Diagrams show the increased excursion of hypodynamic frog's heart on addition to the suspension fluid of Na_2CO_3 , kaolin, $BaSO_4$, $CaCO_3$, or $Na_2C_2O_4$. The mechanism of the effect is discussed. P. W. C.

Effect of various calcium preparations on the amount of lead in blood and urine and its relationship to phosphate metabolism in normal [men]. F. SCHMITT and W. BASSE (Arch. exp. Path. Pharm., 1937, 184, 541—546).—Tables summarise the human plasma- and erythrocyte-Ca, $-PO_4'''$, and $-Pb$ on diets deficient in Ca and with added Ca (as phosphate, gluconate, and lactate) and the urinary excretion of Pb under these conditions. A diet deficient in Ca leads to mobilisation of Pb in blood. Intravenous injection of Ca similarly leads to mobilisation of Pb and increase of both Ca and PO_4''' contents of the plasma and erythrocytes. Oral administration of Ca leads to increased Ca in plasma and erythrocytes, increase of total PO_4''' in both, and greatly increased blood- and urine-Pb. P. W. C.

Magnesium and chloride "permeation" in muscle. E. J. CONWAY and G. CRUESS-CALLAGHAN (Biochem. J., 1937, 31, 828—836; cf. A., 1934, 1398).—The Mg content of frog's sartorius muscle is 26.8 ± 0.6 mg. per 100 g., which falls to 22.3 ± 1.0 mg. after 1—5 days' immersion in Ringer's solution. During this long period of retention of the bound Mg, Mg^{++} enters freely. For short-period immersions Mg^{++} enters the muscle much more slowly than Cl^- . When vol. changes occur in the immersed muscle, the "permeation" val. of Cl^- alters in inverse proportion to the change in tissue H_2O . Cl^- "permeation" is unaffected by Mg. The distribution of Mg in the tissues, plasma, and urine of the frog is examined. E. A. H. R.

Results of feeding various levels of soil containing beryllium to chickens, dogs, and rats. C. W. DUNCAN and E. J. MILLER (J. Nutrition, 1936, 11, 371—382).—Ingestion of considerable amounts of soil containing 0.223% of Be caused no rachitic symptoms, no disturbance of growth, and no diminution in plasma-inorg. P in rats, chicken, or dogs. A. G. P.

Pharmacological action of salts of pure zirconium and pure hafnium. J. VAN NIEKERK (Arch. exp. Path. Pharm., 1937, 184, 686—693).—The action of ZrOCl_2 and HfOCl_2 on smooth muscle of intestine and uterus, surviving heart, and blood vessels is investigated. The two salts have almost identical action. P. W. C.

Action of colloidal cupric oxide on hæmatopoietic tissue and the accumulation of electropositive colloids in the reticulo-endothelial elements. E. MENEGHETTI (Boll. Soc. ital. Biol. sperim., 1937, 12, 63—65).—The phenomenon of hæmatopoietic action previously noted (together with detection of microscopically visible granules in the reticulo-endothelial elements of hæmatopoietic tissue) with injected electronegative colloids also occurs with electropositive colloids (CuO) but the colloidal particles are protected from flocculation and granules are not observed. F. O. H.

Influence of phosphorus on fibroblast culture. K. SAITO (Folia Pharmacol. Japon., 1935, 21, 187—191).—Small doses of P in gum acacia solution increased, and larger doses decreased, the growth of fibroblast. CH. ABS. (p)

Obtaining aberrative forms of butterflies by chemical treatment. J. ZACWILICHOWSKI (Bull. Acad. Polonaise, 1936, B, 481—497).—Colour aberration in butterflies was produced by injection of phospho-tungstic and -molybdic acids into the pupæ. A. G. P.

Influence of boric acid and borax on growth of fibroblast and epithelial cultures: morphological changes following administration of these drugs. M. MAEDA (Folia Pharmacol. Japon., 1935, 21, 213—222).—Small concns. of both substances increase and larger concns. inhibit growth. CH. ABS. (p)

Changes in blood or serum viscosity of the rabbit under influence of alcohol. H. WAKAI (Folia Pharmacol. Japon., 1935, 21, 207—212).—Oral administration of dil. EtOH causes diuresis and a decrease of η in serum and blood without change in sp. η . Larger dosages sufficient to cause a deep narcosis decreased serum-protein, increased the albumin/globulin ratio and (slightly) blood- η and the sp. η of serum. CH. ABS. (p)

Action of " $\beta\gamma$ -hexenol," a constituent of the raw leaves of *Thea sinensis japonica*: comparison of this substance with hexyl alcohol. II. Action on the vessels, skeletal muscles, and motor nerve endings. S. MURAKAMI (Folia Pharmacol. Japon., 1935, 21, 165—174; cf. this vol., 215).—Physiological effects are described. CH. ABS. (p)

Pharmacological action of certain derivatives of pyrrole, pyridine, and pyrazole. R. S. A. HEATHCOTE (Quart. J. Pharm., 1937, 10, 59—66).—Six derivatives were investigated. Comparison with published data indicates that corresponding derivatives of pyrazole and pyrrole are qualitatively similar in their action. R. M. M. O.

Toxicity of various phenols to fresh-water fish. E. HUBAULT (Compt. rend. Acad. Agric.

France, 1936, 22, 324—327).—PhOH is more toxic to *Goudonius rutilus* and *Scardinius erythrophthalmus*, Linn., than *o*-cresol; *m*-5- and *p*-xylenol are still less toxic. A. W. M.

Failure of aspirin to affect urinary excretion of ascorbic acid. J. B. YOUMANS, M. B. CORLETTE, H. FRANK, and M. CORLETTE (Proc. Soc. Exp. Biol. Med., 1937, 36, 73—76).—Ingestion of as much as 2.6 g. of aspirin has no effect on urinary excretion of ascorbic acid. P. G. M.

Pressor action of a group of amines related to ω -aminoacetophenone. M. R. GURD (Quart. J. Pharm., 1937, 10, 1—22).—Twelve derivatives of $\text{NH}_2\text{CH}_2\text{Bz}$ and NH_2CHMeBz were all found to have sympathomimetic properties, but of strength considerably < that of adrenaline. Attempts to grade them quantitatively by their pressor action did not give consistent results. R. M. M. O.

Acidosis associated with administration of *p*-aminobenzenesulphonamide "prontylin." H. SOUTHWORTH (Proc. Soc. Exp. Biol. Med., 1937, 36, 58—61).—Two cases of acidosis are reported with large doses of prontylin; all cases showed a fall in CO_2 -combining power of the plasma. P. G. M.

Twitch tension and initial heat in caffeinised frog muscle. G. SASLOW (J. Cell. Comp. Physiol., 1936, 8, 387—401).—Treatment of frog sartorii with 0.02—0.045% caffeine-Ringer solution increased twitch tension and initial heat production and also resting heat rate both in O_2 and N_2 . M. A. B.

(A) Change in blood- and serum-viscosity of rabbits in hydræmia or under the influence of diuretics with special reference to the relation between specific viscosity and diuresis. (B) Change through intravenous infusion of Ringer-Locke or glucose solutions. (C) Changes brought about by diuretics. H. WAKAI (Folia Pharmacol. Japon., 1935, 21, 114—121, 141—150, 151—160).—(A) The sp. η can be calc. from η and the protein concn. of the blood.

(B) When hydræmia was induced by the infusion, equilibrium was established between the fluid injected and the urine excreted. Change in sp. η was small when Ringer-Locke solution was used but vals. declined when aq. glucose was injected. In the latter case the albumin/globulin quotient also decreased.

(C) Caffeine, theocaine, and theobromine did not affect blood- η but decreased the sp. η . Hg preps. and KOAc decreased blood-protein and - η without affecting sp. η . CH. ABS. (p)

Sheep blow-fly. III. Chemotropism of *Lucilia sericata*, Mg. IV. Chemistry of the fleece with reference to the susceptibility of sheep to blow-fly attack. R. P. HOBSON (Ann. Appl. Biol., 1936, 23, 845—851, 852—861).—III. Attraction of *L. sericata* to putrefying substances is largely attributable to the presence of indole, skatole, and $(\text{NH}_4)_2\text{CO}_3$. Dil. aq. solutions of these substances induce oviposition.

IV. The proportion of suint in the fleece is not necessarily related to susceptibility to blow-fly strike. The p_H of H_2O extracts of the fleece is paralleled by the suint content of the wool. A. G. P.

Glucose utilisation of phloridzinised dogs after hepatectomy. D. R. DRURY, H. C. BERGMAN, and P. O. GREELEY (Amer. J. Physiol., 1936, 117, 323—327).—Completely phloridzinised dogs require about 75 mg. of glucose (I) per kg. per hr. to maintain blood-(I) at the pre-operative level. Lactic acid and muscle-glycogen do not account for the extra (I). The (I):N ratio is about 6 if (I) utilisation and excretion are added together. R. N. C.

Action of catalysin (thionine) in methæmoglobin-forming poisoning. F. HAUSCHILD (Arch. exp. Path. Pharm., 1937, 184, 458—467).—When toxic but not lethal doses of methæmoglobin (I)-forming poisons (NaNO_2 , NH_2Ph , $\text{NHPh}\cdot\text{OH}$) were administered to cats and rabbits such that the (I) content rose to 40—50%, injection of thionine led to almost complete reconversion of (I) into hæmoglobin. The mechanism is discussed (cf. A., 1936, 1293).

P. W. C.

Diffusion coefficients of inulin and other substances of interest in renal physiology.—See A., I, 361.

Relation of lipins to physiological activity. H. H. WILLIAMS and W. E. ANDERSON (Oil and Soap, 1937, 14, 122—124).—The phospholipin and free cholesterol contents of tissue vary directly with its physiological activity. Such activity, however, tends to decrease the content of cholesteryl esters and neutral fat. T. G. G.

Liver-lecithin and -glycogen in normal and thyroidectomised animals. II. F. VACIRCA (Boll. Soc. ital. Biol. sperim., 1936, 11, 966—967; cf. this vol., 178).—Injection of aq. emulsion of lecithin into rabbits, guinea-pigs, and dogs reduces the liver-glycogen. This effect does not occur in thyroidectomised animals or when aq. glucose is simultaneously injected. F. O. H.

Lecithin and blood-sugar in normal and thyroidectomised animals. III. Injection of insulin. IV. Injection of glucose and adrenaline. F. VACIRCA (Boll. Soc. ital. Biol. sperim., 1936, 11, 968—969, 970—971; cf. preceding abstract).—Injection of an aq. emulsion of lecithin increases liver-glycogenolysis and hence renders the normal (but not thyroidectomised) animal less sensitive to the hypoglycæmic action of insulin or to the hyperglycæmic action of glucose or adrenaline. F. O. H.

Action of choline on the fatty liver due to phloridzin. F. CEDRANGOLO and R. CONTE-MAROTTA (Boll. Soc. ital. Biol. sperim., 1937, 12, 12—14).—With rats subcutaneously injected with phloridzin, the liver-glycogen is increased and, to a smaller extent, liver-fat is diminished by oral administration of choline (cf. this vol., 18). F. O. H.

Effect of sympathomimetic and parasympathomimetic substances on the chemical processes producing the energy of muscular contraction. II. Effect of acetylcholine. A. MARNAY and D. NACHMANSOHN. III. Effect of adrenaline on minced muscle. D. NACHMANSOHN (Bull. Soc. Chim. biol., 1937, 19, 446—452, 453—459; cf. A., 1936, 1295).—II. Acetylcholine (I), like adren-

aline (II), accelerates anaërobic glycolysis in muscle, but whilst (II) causes a resynthesis of phosphagen (III), (I), like other parasympathomimetic substances such as K^+ and pilocarpine, accelerates the decomp. of (III). The (I) concn. required to produce this effect is about 1/60 of that of K^+ .

III. (II), in concns. of 5—10 $\times 10^{-4}\%$, accelerates glycolysis in minced frog's muscle. Phosphorylation is promoted (even when glycolysis is inhibited by F^-) and the hexose monophosphate content increases.

E. A. H. R.

Pharmacological studies of the automatic movement of the rabbit testicle. II. Influence of the thyroid and pancreas on the sensitivity of the testicle towards acetylcholine and adrenaline. R. UCHIHASHI (Folia Pharmacol. Japon., 1935, 21, 175—186).—One day after thyroidectomy the sensitivity of the musculature of the rabbit testicle to adrenaline (I) and acetylcholine (II) is increased; subsequently it returns to normal. Repeated injection of thyroxine increases the sensitivity to (II) and diminishes that to (I). Repeated injection of insulin increases sensitivity to (II) whereas that to (I) is unchanged or weakened. Thyroid and pancreas may be concerned in the maintenance of the tonus of the motor nerves of the testicle. CH. ABS. (*p*)

Effect of acetylcholine and other constituents of the adrenal gland on blood-sugar and -amino-acids. B. L. DAVIS, jun., and J. M. LUCK (Amer. J. Physiol., 1936, 117, 542—552).—Acetylcholine (I) causes hyperglycæmia in rabbits if convulsions occur, but moderate hypoglycæmia in their absence. After adreno-medullectomy (I) always causes hyperglycæmia, which is therefore not due to adrenaline (II) discharge. Blood- NH_2 -acids (III) are increased both in normal and adreno-medullectomised animals, whether or not convulsions appear. Cortin and ascorbic acid do not affect blood-sugar or (III). The min. dose of (II) required for hyperglycæmia is slightly < that required to depress (III). R. N. C.

Response of the spleen to the intravenous injection of certain secretin preparations, acetylcholine, and histamine. J. FERGUSON, A. C. IVY, and H. GREENGARD (Amer. J. Physiol., 1936, 117, 701—707). R. N. C.

Inhibition by alcohols of the effect of acetylcholine and histamine on the isolated intestine of the guinea-pig. M. GUILLOT and O. S. GWAN (Compt. rend. Soc. Biol., 1937, 125, 33—35).—The sensitivity of the muscle is decreased by various aliphatic alcohols. H. G. R.

Effect of anti-esterases on the pharmacodynamic action of acetylcholine. E. KAHANE and J. LÉVY (Compt. rend. Soc. Biol., 1937, 125, 252—256).—The sensitising action on muscle of geneserine (I), ephedrine, antipyrine, and choline (II) is < that of eserine, whilst only (I) and (II) have a similar effect on the hypotensive action of acetylcholine on the dog. H. G. R.

Effect of amino-acids on the action of histamine on the intestine. S. EDLBACHER, P. JUCKER, and H. BAUR (Z. physiol. Chem., 1937, 247, 63—64; cf. Bloch and Pinösch, A., 1936, 885).—The action

of histamine on the isolated intestine is strongly inhibited by arginine (I), histidine, and cysteine but not by other NH_2 -acids. (I) does not inhibit the action of acetylcholine. W. McC.

Effect of cysteine on hereditary hypotrichosis in the rat (*Mus norvegicus*). E. ROBERTS (J. Biol. Chem., 1937, 118, 627—630).—There was no evidence that cysteine affects hereditary hypotrichosis in rats (cf. Martin and Gardner, A., 1935, 1402). P. G. M.

Liver and creatinuria. I. I. NITZESCU and I. GONTZEA (Compt. rend. Soc. Biol., 1937, 125, 77—80).—Excretion of creatine (I) is decreased in dogs on a meat-free diet and increased on intravenous injection of (I). P poisoning decreases the (I) tolerance.

H. G. R.

Effectiveness of orally administered diastase in achylia pancreatica in dogs. J. M. BEAZELL, C. R. SCHMIDT, and A. C. IVY (J. Nutrition, 1937, 13, 29—37).—Abs. achylia produced by separating the pancreas from the duodenum caused a marked increase in faecal starch. Administration of diastatic enzymes lowered the starch loss, vegetable diastases being more effective than pancreatic amylase (I). Enteric coating of (I) rendered it as effective as plant diastase.

A. G. P.

Effect of enteric-coated pancreatin on fat and protein digestion of depancreatized dogs. W. A. SELLE [with I. W. MOODY] (J. Nutrition, 1937, 13, 15—28).—Administration of pancreatin preps. to depancreatized dogs sustained with insulin reduced the faecal loss of N, increased the elimination time to normal, but had no effect on the loss of fat. The coating (a resinous, substance sol. in alkali at p_H 4, designed to protect pancreatin against inactivation by gastric juice) did not affect the digestion of fat or protein.

A. G. P.

Relation of pancreatic juice to pancreatic diabetes. H. P. HARMS, J. VAN PROHASKA, and L. R. DRAGSTEDT (Amer. J. Physiol., 1936, 117, 160—165).—Complete withdrawal of pancreatic juice for 4—6 weeks in dogs does not induce hyperglycaemia or glycosuria. Oral administration of pancreatic juice to depancreatized dogs does not affect the diabetes, but on a standard diet and insulin intake it usually increases the glucose excretion. R. N. C.

Toxic action of hæmolysed erythrocytes. L. WALTERSKIRCHEN and S. ZACHERL (Arch. exp. Path. Pharm., 1937, 184, 659—666).—When guinea-pig erythrocytes are hæmolysed by rabbit serum *in vitro*, a substance is formed which, when injected intravenously into cats, causes considerable lowering of blood pressure. When the cells are hæmolysed with H_2O , no such substance is formed. Pretreatment of the animal with physostigmine increases, and with atropine decreases, the effect.

P. W. C.

Liberation of a sympathicomimetic substance by section of the vagus nerves in the neck of the decapsulated dog. F. JOURDAN and G. MORIN (Compt. rend. Soc. Biol., 1937, 125, 285—287).

H. G. R.

Colloidal metal absorption by tissue cells. I. Influence of serum, serum-albumin, and serum-globulin on metal absorption by surviving

rabbit liver. II. Influence of various lyophile colloids on metal absorption of tissue cells in surviving rabbit liver. III. Influence of lyophile colloids on metal absorption of tissue cells of surviving spleen and kidney. K. S. LEE (Folia Pharmacol. Japon., 1935, 21, 1—9).—I. In presence of rabbit serum, serum-albumin and -globulin the amount of Ag remaining in liver-tissues after perfusion with collargol 0.02% in aq. NaCl 0.85% was approx. half that remaining when these colloids were absent.

II. Presence of peptone, ovalbumin, egg white protein (I), gelatin (II), or gum arabic increases the Ag remaining in liver after perfusion with collargol. Starch had little effect.

III. Lyophilic colloid [serum, (I), or (II)] decreased the amount of Ag absorbed. Serum was the most effective.

CH. ABS. (p)

Increased water exchange following Eck fistula in dogs. L. A. CRANDALL, jun., and G. M. ROBERTS (Amer. J. Physiol., 1936, 117, 318—322).—Eck fistulae and CHCl_3 poisoning lead to increased voluntary H_2O intake and excretion. The increased H_2O exchange is correlated with a greater dilution of plasma-Cl' after oral administration of H_2O .

R. N. C.

Divinyl ether as a general anæsthetic. I. S. RAYDIN, E. L. ELIASON, G. M. COATES, T. B. HOLLOWAY, L. K. FERGUSON, A. B. GILL, and T. J. COOK (J. Amer. Med. Assoc., 1937, 108, 1163—1167).—Divinyl ether may be used for anæsthesia of short duration, simultaneous administration of O_2 being required for periods >45 min. The toxicity is > that of Et_2O but < that of CHCl_3 .

H. G. R.

Antagonism of narcotics and the analeptics coramine and picrotoxin. H. T. A. HAAS (Arch. exp. Path. Pharm., 1937, 184, 468—475).—In determinations of the min. dose of narcotic which inhibits the action in rats of doses 40% > the lethal dose of coramine (I), picrotoxin (II) and cardiazole (III), it is shown that antagonistic action to a particular analeptic only occurs with certain narcotics; e.g., chloral hydrate protects against (I) and (II), avertin against (I), urethane against (III) and (II).

P. W. C.

Influence of analeptics on avertin narcosis. K. ZIPF and H. MERTINS (Arch. exp. Path. Pharm., 1937, 184, 702—709).—Intraperitoneal injection of avertin (0.4 g. per kg.) into the rat causes a deep narcosis which is best antagonised by cardiazole-ephedrine, cardiazole, and ikoral. Hexetone and strychnine have only a slight antagonistic action. Coramine prolongs and intensifies narcosis.

P. W. C.

[Pharmacology of] 2-methylallyl derivatives of barbituric acid. E. E. SWANSON and W. E. FRY (J. Amer. Pharm. Assoc., 1937, 26, 317—319).—Comparison of 22 methylallyl derivatives with the parent barbituric acids indicates that the former have a shorter duration of action.

F. O. H.

Distribution of veronal over the organs in a fatal case of veronal poisoning. J. F. REITH (Pharm. Weekblad, 1937, 74, 649—652).—The veronal contents of the small and large intestines, duodenum, stomach, urine, gall-bladder, muscle, liver, spleen,

kidney, and blood were determined. The body contained 6.29 g. of unabsorbed and 4.27 g. of reabsorbed veronal. S. C.

Comparison of atropine and syntropan. K. FROMHERZ (J. Pharm. Exp. Ther., 1937, 60, 1—13).—The toxicity of syntropan (I) with rodents is $>$, and with cats is $<$, that of atropine (II). With cats the mydriatic action of (I) is 1000 times $<$ and the parasympathetic depressant action is 500 times $<$ that of (II). With rabbits, the action of (I) on salivary secretion in urethane narcosis excited by pilocarpine is 100 times $<$ and the spasmolytic action exerted through the nerve endings of the isolated intestine is 20 times $<$ that of (II). P. W. C.

Antagonism between adrenaline and some isoquinoline derivatives: cotarnine and anhydrocotarnine-N-methyloxindole. F. P. LUDUEÑA (Quart. J. Pharm., 1937, 10, 67—80).—Both drugs in suitable quantities transitorily inhibit the pressor action of adrenaline by direct action on peripheral nerve endings but do not reverse this action. They are, however, both hypotensive and so their own action may be masking any such reversal. Their direct action on the uterus, which depends on the dose, is also examined. R. M. M. O.

Influence of the thymus hormone on the poisonous action of opium alkaloids. K. ARIMA (Folia Pharmacol. Japon., 1935, 21, 41—47).—In young suckling rabbits thymusectomy diminished and injection of thymus extract greatly increased the sensitivity to morphine, heroin, and codeine.

CH. ABS. (p)

Relief of spasm by opium alkaloids. K. PLUM (Arch. exp. Path. Pharm., 1937, 184, 126—132).—Using leech muscle free from nerve centres, the ability to relieve nicotine spasm of the following alkaloids is given by the ratios thebaine:codeine:morphine:papaverine:narcotine:narceine = 80:10:9:7:2:1. P. W. C.

Mutual action of cocaine and opium alkaloids. F. EICHHOLTZ and W. KRAUTH (Arch. exp. Path. Pharm., 1937, 184, 667—673).—Morphine and other opium alkaloids increase cocaine spasm. P. W. C.

Increase of the blood-pressure action of adrenaline substances by sparteine. W. GRAUBNER and H. KRAUS (Arch. exp. Path. Pharm., 1937, 184, 235—240).—Pretreatment of cats and dogs with sparteine increases and prolongs the action of adrenaline, sympatol, and metasympatol on blood pressure. After removal of the adrenals the action is completely inhibited. P. W. C.

Determination of small amounts of strychnine with *Carassius vulgaris*. K. PLUM (Arch. exp. Path. Pharm., 1937, 184, 133—138).—A method is described for the detection of 0.0001 mg. of strychnine in terms of its effect on small (4-cm.) carp (*C. vulgaris*). P. W. C.

Strychnine and chronaxie. P. K. KNOEFEL (Amer. J. Physiol., 1936, 117, 638—641).

R. N. C.

Alkaloids of ergot. G. BARGER (Analyst, 1937, 62, 340—354).—The nature and structure of these alkaloids and the toxicology of convulsive and

gangrenous ergotism are discussed. Methods of chemical, colorimetric, and spectroscopic assay, and the separate assay of ergometrine, are described.

J. G.

Absorption of ouabain (Gratus-strophanthin) by the liver in heart-lung-liver preparations. M. KIESE, H. GUMMEL, and R. S. GARAN (Arch. exp. Path. Pharm., 1937, 184, 197—213).—Using a dog's heart-lung-liver prep., the amount of ouabain fixed by the liver is 1.53×10^{-6} g. per g. of liver and using a heart-lung prep. the lethal dose is 2.24×10^{-6} g. per g. of heart. P. W. C.

Evaluation of digitalis preparations by oral administration. L. W. VAN ESVELD (Arch. exp. Path. Pharm., 1937, 184, 450—457).—A method is described for determination of the lethal dose of digitalis preps. on oral administration to decerebrate cats and the results are compared with those by intravenous injection. Expressed as a % of the dose by injection, the oral doses are for folinerin 40—50%, digitoxin and verodigen 50—60%, digisol, digitalysatum, digalen, lanadigin, and digilamid 75—125%, digitoxigenin 600%, and gitoxigenin 1000%. P. W. C.

Difference in action of *Digitalis purpurea* and *D. lanata*. (Investigation with cold-blooded animals.) F. HEIM (Arch. exp. Path. Pharm., 1937, 184, 214—228).—Using perfused frog's hearts, the latent period with *D. purpurea* (I) is 3—4 times as large as with *D. lanata* (II), the max. performance of work is reached more quickly with (II) than with (I), and with perfused frog's kidney the diuretic action is more regularly produced with (I) than (II).

P. W. C.

Standard digitalis powder of the U.S.P. C. W. EDMUNDS, C. A. MOYER, and J. R. SHAW (J. Amer. Pharm. Assoc., 1937, 26, 290—305).—Biological methods of assay of digitalis preps. are critically examined. Comparison of standard powders by these methods indicates that the order of decreasing potency is U.S.P., British, Canadian. F. O. H.

Poisonous action of colloidal elements. W. BILTZ (Kolloid-Z., 1937, 79, 222).—Historical (cf. Labes, this vol., 218). F. L. U.

Pharmacology of arsenic and antimony. H. A. OELKERS (Arch. exp. Path. Pharm., 1937, 184, 276—288).—Cathepsin, all serum- and organ-lipases of man and other animals, and muscle-esterase of rabbit are inhibited by As and by tartar emetic. The effect of these poisons on the vascular system is investigated. P. W. C.

Glycæmic curve during experimental potassium cyanide poisoning. F. DOMENICI (Boll. Soc. ital. Biol. sperim., 1937, 12, 30).—Administration of KCN produces first an increase in the reducing power of the blood and then a steady decrease to zero vals.; simultaneously the CN' content diminishes (cf. this vol., 29). Probably glucose cyanohydrin is formed. F. O. H.

Histochemical detection of lead in the gastrointestinal tract. H. SCHÖNLEBE (Arch. exp. Path. Pharm., 1937, 184, 289—295).—The mucous cells of the stomach and the goblet cells of the small and large

intestines of guinea-pigs poisoned with Pb are shown by treatment with H_2S to contain Pb, these cells probably serving as a means of excretion. P. W. C.

Use of the allometric formula. L. LAPICQUE (Bull. Soc. Chim. biol., 1937, 19, 434—440).—Polemical. E. A. H. R.

Enzyme-substrate compounds in enzymic reactions. G. MEDVEDEV (Enzymologia, 1937, 2, 1—8).—A theory of enzymic kinetics based on mol. statistical mechanics is advanced. Compounds between enzyme and substrate play a negative rôle in the mechanism of enzymic reactions. E. A. H. R.

Energy of activation and temperature constants of enzymic reactions. G. MEDVEDEV (Enzymologia, 1937, 2, 31—36).—The temp. coeff. of enzymic reactions decreases with increasing temp., as does the Arrhenius const., A , whilst the energy of activation, E , varies but little. At low temp. A and E differ considerably but at higher, and optimal, temp. they have approx. the same vals. From the experimental vals. for A the true vals. for E for a series of enzymic reactions are calc. E. A. H. R.

Dehydrogenase systems of muscle and Jensen sarcoma in the rat. H. VON EULER, E. ADLER, and G. GÜNTHER (Z. physiol. Chem., 1937, 247, 65—78).—The lactic (I) and malic dehydrogenase (II) systems of extracts of the sarcoma do not differ (e.g., in their dependence on p_H) from those of muscle extracts but the ratio (I) : (II) in sarcoma extracts is > that in muscle extracts. W. McC.

Enzymic inactivation of codehydrogenase. II. H. VON EULER, H. HEIWINKEL, and F. SCHLENK (Z. physiol. Chem., 1937, 247, IV—V; cf. this vol., 222).—Organs rapidly inactivate cozymase and dehydrocozymase, 90% inactivation being attained in rat muscle in 2 hr. Similarly codehydrogenase II is almost completely inactivated in about 3 hr. W. McC.

Synthetic dehydrogenases. W. LANGENBECK and L. WESCHKY (Ber., 1937, 70, [B], 1039).—2-Methylpyridine is superior to C_5H_5N in accelerating the decolorisation of methylene-blue by alanine in presence of isatin-4- and -6- but not of -5- or -7-carboxylic acid or of isatin. H. W.

Colorimetric determination of the decolorisation of methylene-blue by dehydrogenase enzyme preparations. H. J. PISTOR (Z. physiol. Chem., 1937, 246, 248—257).—An apparatus, depending on the use of a step-photometer, is described. Its application to the dehydrogenase activity of *Acetobacter peroxydans* indicates that the accelerating action of $M/1000$ — $M/150$ -KCN is due to change in $[H^+]$ (cf. Wieland and Pistor, A., 1936, 893) and that the dependence on p_H occurs in both O_2 and H_2 . F. O. H.

Respiratory catalysis by C_4 dicarboxylic acids. K. LAKI, F. B. STRAUB, and A. SZENT-GYÖRGYI (Z. physiol. Chem., 1937, 247, I—II).—In respiratory catalysis, the use of cytochrome- C (I) as indicator shows that the two stages of oxidation are successive and that C_4 dicarboxylic acids take part in both. In the equilibrium mixture of fumaric (II) and malic acid (III), activation by succinic and malic dehydro-

genase causes transfer of 2 H from (III) to (II) with production of oxalacetic (IV) and succinic acid (V). (V) is then converted by (I) into (II) whilst (IV) is dehydrogenated by the nutrient medium to (III). The oxidation-reduction potential of the system (III)–(IV) is approx. equal to that of the system lactic acid– $AcCO_2H$. W. McC.

Degradation of citric acid. C. MARTINS (Z. physiol. Chem., 1937, 247, 104—110).—In the enzymic degradation of citric acid (I) the following two-stage process probably predominates. (I) loses H_2O giving *cis*-aconitic acid (II) which probably takes up H_2O again giving isocitric acid (III). (II) and (III) are dehydrogenated to oxalosuccinic acid which loses CO_2 (probably spontaneously) and so yields α -ketoglutaric acid (IV). The final product is succinic acid produced by decarboxylation and dehydrogenation of (IV). (II) has been converted into (I) by citric dehydrogenase, which must consist of at least two components only one of which, viz., that which dehydrogenates (II) and (III), is a true dehydrogenase. The reactions (I) \rightarrow (II) and (II) \rightarrow (III) are reversible. W. McC.

Crystalline catalase. J. B. SUMNER and A. L. DOUNCE (Science, 1937, 85, 366—367).—The prep. from beef liver of cryst. catalase, agreeing in properties with preps. of other investigators (cf. A., 1927, 376; 1931, 123), is described. L. S. T.

Aldehyde mutase. (A) D. MICHLIN. (B) M. DIXON and C. LUTWAK-MANN (Nature, 1937, 139, 926—927, 927).—(A) A claim for priority (cf. this vol., 220).

(B) The claim is disputed. L. S. T.

Choline-esterase activity of human sera with reference to hyperthyroidism. W. ANTROPOL, L. TUCHMAN, and A. SCHIFRIN (Proc. Soc. Exp. Biol. Med., 1937, 36, 46—50).—Acetylcholine-esterase of serum is relatively high in cases of untreated hyperthyroidism. P. G. M.

Distribution of choline-esterase in the sartorius muscle of the frog. A. MARNAY and D. NACHMANSOHN (Compt. rend. Soc. Biol., 1937, 125, 41—43).—The concn. at the nerve endings is considerably > that of the aneural portion. H. G. R.

Choline-esterase in the nerve endings of striated muscle. A. MARNAY, B. MINZ, and D. NACHMANSOHN (Compt. rend. Soc. Biol., 1937, 125, 43—47).—Further evidence is given for the presence of a high concn. of the enzyme at the nerve endings (cf. this vol., 139). H. G. R.

Velocity of hydrolysis of some monoacid triglycerides under the influence of pancreatic extract. II. Influence of reaction products and the constitution of the triglyceride on the velocity of hydrolysis. K. HOLWERDA, P. E. VERKADE, and A. H. A. DE WILLIGEN (Rec. trav. chim., 1937, 56, 382—408; cf. A., 1936, 297).—Comparative hydrolysis experiments are described with trioctoin (I), trinonoin, tridecain, and triundecain at an initial p_H of 8.3, 6.5, 5.0, and 4.0, respectively. The influence of the corresponding acids and of their Na soaps on the velocity of hydrolysis of (I) is compared under

various conditions. The neutralisation curves of these acids are obtained and their partition between aq. and lipid phases during hydrolysis is investigated. The four acids inhibited hydrolysis by pancreatic extract to the same extent. The constitution of the triglycerides had no direct and measurable influence, but had an indirect effect since the Na salts of the acids inhibited to very different extents. The mechanism of the inhibition is discussed. P. W. C.

Enzymic ester syntheses. E. A. SYM and W. SWIATKOWSKA (Enzymologia, 1937, 2, 79—80).—The enzymic synthesis is recorded of the Bu esters of malonic, succinic, glutaric, phthalic, lactic, and salicylic acids by the method previously described (A., 1936, 1298). E. A. H. R.

Effect of various metals in the form of ionisable or complex salts on the activation of hepatic arginase by vitamin-C. A. BADINAND (Compt. rend. Soc. Biol., 1937, 125, 283—284).—Arginase is not affected by vitamin-C but is activated by Fe^{II} , Fe^{III} , and Mn, and inhibited by Ca and Cu.

H. G. R.

Proteolytic enzymes. XIV. Nature of the enzymic degradation of proteins. M. BERGMANN and C. NIEMANN (J. Biol. Chem., 1937, 118, 781—788; cf. A., 1937, II, 234).—Fibrin from ox blood digested for 20 days at 37° with papain and HCN yields tyrosine (I), tryptophan, leucine, isoleucine, and phenylalanine. Since (I) is produced also when digestion occurs in presence of $\text{NHPh}\cdot\text{NH}_2$, it follows that both the enzymes of papain liberate (I) from proteins. The view that proteinases degrade proteins at least partly to NH_2 -acids is thus upheld.

W. McC.

Differentiation of pancreatic trypsin on the basis of their specificities. M. BERGMANN, J. S. FRUTON, and H. POLLOK (Science, 1937, 85, 410—411).—Cryst. trypsin readily hydrolyses α -benzoyl-L-arginineamide, chymotrypsin, carbobenzyloxy-L-tyrosylglycineamide, and carbobenzyloxyglycyl-L-phenylalanyl-glycineamide, and heterotrypsin (I) hydrolyses benzoylglycyl-L-lysineamide. By means of these synthetic substrates determinations of each of the trypsin in presence of each other and of their respective biological activities can be made. Thus, commercial pancreatin contains much (I), to which its activity toward genuine proteins must be mainly due.

L. S. T.

Preparation of trypsin-free aminopolypeptidase. G. ÅGREN (Z. physiol. Chem., 1937, 246, 280—282).—Aminopolypeptidase preps. obtained by 30% glycerol extraction of the pyloric and duodenal mucosa of pigs contain respectively no and very little trypsin (cf. Linderstrøm-Lang *et al.*, A., 1935, 1025). Dipeptidase and, to a much smaller extent, aminopolypeptidase in the preps. are adsorbed by $\text{Fe}(\text{OH})_3$.

F. O. H.

Dilatometric ultra-micro-determination of peptidase activity. K. LINDERSTRØM-LANG (Nature, 1937, 139, 713—714).—The falling drop method for the determination of d has been applied on the micro-scale to the determination of enzymic activity. Curves showing the change in d with time

and the amount of NH_2 -N liberated are given for mixtures of *dl*-alanylglycine and peptidase.

L. S. T.

Yeast amylase. IV. Properties. Optimum p_H and temperature. K. ONO (J. Agric. Chem. Soc. Japan, 1935, 11, 803—807; cf. A., 1935, 1415).—Amylase from yeast [by $(\text{NH}_4)_2\text{HPO}_4$] showed optimum starch hydrolysis with p_H 6.2—6.6 at 22.5° and 6.0 — 6.2 at 30° . Optimum temp. was 25 — 30° at p_H 6.4.

CH. ABS. (p)

Koji amylase. VI. Formation of amylase, maltase, and protease during cultivation of saké-koji. VII. Effects of cultivation temperature and degree of polishing of rice on formation of amylase, maltase, and protease in saké-koji. VIII. Fluctuation of amylase during cultivation of yeast preparations (moto). Y. TOKUOKA (Bull. Agric. Chem. Soc. Japan, 1937, 13, 275—280, 281—285, 313—317).—VI. The enzyme prep. is obtained by extracting saké-koji with 1% NaCl for 3—5 hr. at room temp.; longer times or higher temp. cause destruction of the enzymes. The relative amounts of amylase (I), maltase (II), and protease (III) are const. at any stage of cultivation of saké-koji.

VII. Saké-koji from unpolished rice contains the highest concn. of (I), but very little difference occurs in the relative amounts of (I), (II), and (III) for various degrees of polishing. The enzymic activity, especially that of (II), is decreased by cultivation of the koji at 48 — 51° instead of 30 — 45° .

VIII. The fluctuation in the amounts of (I) is very similar to that of saké mash. The total amount of (I) is decreased during cultivation owing to rise of temp. and production of acid and EtOH.

J. N. A.

Enzymes of grain. III. Relation between the action of the starch-liquefying enzyme of rice and p_H . G. YAMAGISHI (J. Agric. Chem. Soc. Japan, 1935, 11, 825—835; cf. A., 1936, 1418).—The optimum p_H of aq. and salt extracts and dialysates of polished and unpolished rice are determined.

CH. ABS. (p)

Amylase in subcutaneous adipose tissue. F. CEDRANGOLO (Boll. Soc. ital. Biol. sperim., 1937, 12, 12).—A slight amylase activity was detected in the tissue (dog).

F. O. H.

Action of taka-diastase on the monophosphoric esters of *n*- and *iso*-propyl alcohol. J. COURTOIS and P. DENIS (Bull. Soc. Chim. biol., 1937, 19, 496—507).—Modifications in the syntheses of $\text{Pr}^n\text{H}_2\text{PO}_4$ (I) and $\text{Pr}^i\text{H}_2\text{PO}_4$ (II) are described. The p_H optimum of the hydrolysis of (I) and (II) becomes less acidic as the substrate concn. increases. Taka-diastase has a greater affinity for (II) than for (I), but (I) is hydrolysed more rapidly. The affinity of the phosphatase for (I) and (II) increases with acidity.

E. A. H. R.

Kinetic theory of invertase action. G. MEDVEDEV (Enzymologia, 1937, 2, 53—72).—A theory for the mechanism of enzyme reactions is advanced, based on the assumption of inelastic collisions of the second order between mols. An equation for the kinetics of invertase action is developed which fits the experi-

mental facts. The theory accounts for the abnormal temp. coeffs. of enzymic reactions, for which an exact formulation is given, and enables the abs. magnitude of the velocity of enzymic reactions to be calc.

E. A. H. R.

Rôle of active acidity in the enzymic inversion of sucrose.—See A., I, 368.

Phosphorylation and oxido-reduction during the degradation of glucose in the brain. E. ADLER, F. CALVET, H. VON EULER, and G. GÜNTHER (Naturwiss., 1937, 25, 282).—The glycolytic enzyme system of brain tissue resembles those of embryonic tissue and of tumours, and differs from the muscle-enzyme in that it can effect the glycolysis of glucose (I) itself. The first stage in the glycolysis of (I) by the brain-enzyme is accompanied by the disappearance of the labile adenosine triphosphate and probably involves phosphorylation. Other evidence indicates that phosphorylated products are intermediaries in the production of lactic acid (II) from (I) in presence of the brain-enzyme. The inhibiting effect on (II) production of glyceraldehyde is characteristic of the brain, tumour, and embryonic tissue enzymes as contrasted with the muscle systems. W. O. K.

Phosphatases and activation by magnesium salts. II. "Alkaline" phosphatase of the placenta. C. CATTANEO, G. SCOZ, and M. C. GABRIELLI (Boll. Soc. ital. Biol. sperim., 1937, 12, 37—38; cf. Busse, A., 1936, 1420).—In its action on 0.2*M*-Na β -glycerophosphate at p_H 9.4, the enzyme is activated (or a natural inhibitor is suppressed) by $MgSO_4$ (optimum concn. 0.0022*M*). F. O. H.

Activation of alkaline phosphatase by magnesium salts. C. CATTANEO, M. C. GABRIELLI, and G. SCOZ (Enzymologia, 1937, 2, 17—30).—The action of Mg^{++} on alkaline phosphatase (I) is slight and temporary when (I) concn. is high and when the glycerophosphate is nearly in equilibrium with its products of decomp. With very low (I) concns. the effect of Mg^{++} is much larger and may increase with time. The addition of Mg^{++} retards the rate of inactivation of (I) but cannot reactivate completely exhausted (I) preps. Equations are developed for the course of the enzymic reaction with preps. of varying activity, and for the relation between extent of reaction, (I) concn., and the duration of the reaction. E. A. H. R.

Phosphatase in adipose tissue. M. SAVIANO (Enzymologia, 1937, 2, 43—46).—A phosphatase, cleaving hexose diphosphate, occurs in the adipose tissue of the dog. The activity is > that of glycerophosphatase but the p_H optimum of the two enzymes is the same. E. A. H. R.

Action of alkali on cozymase. R. VESTIN and H. VON EULER (Z. physiol. Chem., 1937, 247, 43—51).—Cozymase (I) is converted from a monobasic into a tribasic acid by heating with dil. (e.g., 0.05*N*) alkali at 95° for <40 min. Intact (I) in alkaline solution combines with 7—8 equivs. of I per mol. but after heating with 0.05*N*-NaOH the val. is 3 equivs. whilst inorg. PO_4''' is liberated, an acid-labile phosphoric ester (II) produced, and fermenting power destroyed. The inactive material obtained

contains an adenine residue readily eliminated by acid. The changes in I combination and the production of acidic groups and (II) proceed in parallel.

W. McC.

Action of alkali on cozymase. F. SCHLENK, H. VON EULER, H. HEIWINKEL, W. GLEIM, and H. NYSTRÖM (Z. physiol. Chem., 1937, 247, 23—33).—Cozymase (I) has no PO_4''' -carrying power. A method of separating (I) from accompanying adenylic acid (II) and a procedure for determining PO_4''' carriers in systems containing (I) are described. An account is given of the probable course of the concurrent or successive reactions believed to occur when dil. aq. NaOH (hot or cold) acts on (I) with production of nicotinamide and, possibly (II), adenosinediphosphoric acid, and other substances. W. McC.

Adenosinediphosphoric acid from cozymase. H. VON EULER, F. SCHLENK, and R. VESTIN (Naturwiss., 1937, 25, 318).—A preliminary announcement of the isolation of adenosinediphosphoric acid after alkaline hydrolysis of cozymase. P. W. C.

Rôle of manganese for the phosphate-transfer function of cozymase. P. OHLMEYER and S. OCHOA (Naturwiss., 1937, 25, 253).—Small amounts of Mn (0.1—1.0 $\times 10^{-3}\%$) activate the transfer of PO_4''' from phosphopyruvic acid to glucose by cozymase (I) without any detectable formation of (I) pyrophosphate. Mn also activates adenylic acid, adenylyl pyrophosphate, and alkali-inactivated (I) in their phosphorylating effects and can replace the Mg^{++} necessary for the phosphorylation.

E. A. H. R.

Effect of manganese on the action of cozymase, adenylic acid, and cocarboxylase. H. VON EULER, E. ADLER, G. GÜNTHER, and R. VESTIN (Z. physiol. Chem., 1937, 247, 127—134; cf. preceding abstract).—In muscle extract production of lactic acid (I) occurs only when cozymase (II) and adenylic acid (III) are present together. (II) alone does not cause production of (I) even when Mn^{++} is added, but Mn^{++} activates the glycolysis when (III) and sub-optimal amounts of (II) are present. Catalysis of the production of inorg. PO_4''' from phosphoglyceric acid (IV) by (III) in the extract is inhibited by Mn^{++} , which does not confer on (II) the power to stimulate the action. Mn^{++} also diminishes the interchange of PO_4''' between phosphocreatine and cophosphorylase, but greatly accelerates the fermentation of (IV) by yeast maceration juice in presence of (III) although the acceleration is much less pronounced when (II) replaces (III). In the system EtOH-*alcohol*-apodehydrogenase-(II) production of dihydrocozymase is not accelerated by Mn^{++} . W. McC.

Yeasts in the normal mouth. F. C. LAWLER (Amer. J. Pharm., 1937, 109, 167—182).—Two types of yeasts were found in 80% of the normal mouths examined. H. G. R.

Nitrogen assimilation of yeast. VIII. Excretion of nitrogen during growth. N. NIELSEN and V. HARTELUS (Compt. rend. Lab. Carlsberg, 1937, 22, Ser. physiol., 23—47; cf. A., 1936, 1300).—No excretion of NH_3 from yeast occurs during growth on sugar-containing media (with a little wort as

source of bios) when glycine or $(\text{NH}_4)_2\text{SO}_4$ is the available source of N. With excess of $(\text{NH}_4)_2\text{SO}_4$, N excretion is greatest when growth is most active, ceases when the sugar is exhausted, and increases again when autolysis sets in; the excretion during growth is fairly const. (approx. $\frac{1}{3}$ of the N assimilated), whilst excretion during autolysis is more variable. With only small amounts of $(\text{NH}_4)_2\text{SO}_4$, the excretion during growth is smaller, being dependent on the N content of the yeast. Excretion of N during growth is $>$ that during autolysis. I. A. P.

Ammonium salts and amino-acids as nitrogen sources in the production of pressed yeast. F. WAGNER (Zentr. Bakt. Par., 1936, II, 93, 359—371).—Yields of yeast were increased by addition of "yeast-vitamin" (completin) from fresh plants to sugar- NH_4 salt media. Mixtures of NH_2 -acids afforded a better source of N than did asparagine, which, in turn, was superior to NH_4^+ salts. Differences are ascribed partly to better utilisation of NH_2 -acids and partly to the diminution of the γ of the medium with consequent improved aëration. A. G. P.

Urease of yeast. K. SAKAGUCHI and Y. SHIZUME (Bull. Agric. Chem. Soc. Japan, 1937, 13, 309—313).—Of 62 species of yeast, 8 produced NH_3 in a medium containing urea as sole source of N. Ureolysis was also shown with yeast autolysates in presence of PhMe. J. N. A.

Reducing power of living yeasts during alcoholic fermentation. C. FROMAGEOT and G. BOST (Compt. rend., 1937, 204, 1008—1010; cf. A., 1936, 1300).—The r_H developed by different consns. of *Saccharomyces cerevisiae*, at different p_H , in 10—20% aq. sucrose at 28° is determined by an indicator method. Wide variations in the concn. of yeast (10—0.25%) at any p_H leaves the final r_H unchanged, but as the p_H and the yeast concn. diminish, the r_H usually increases. J. L. D.

Biocatalytic activators specific for the yeast fermentation of maltose. M. J. BLISH and R. M. SANDSTEDT (J. Biol. Chem., 1937, 118, 765—780; cf. B., 1934, 167, 858).—Fresh bakers' pressed yeast usually has little power to ferment pure maltose but dried yeast and flour (especially from malted wheat) contain accelerators of fermentation which greatly reduce or eliminate the induction period, and increase the rate and completeness of fermentation. The activator of flour resembles von Euler's factor Z (cf. A., 1925, i, 209) which possibly also occurs in yeast, but dried yeast contains also a factor M, unstable towards heat and EtOH. W. McC.

New inorganic phosphorus compound in yeast and the composition of adenosinepolyphosphoric acids. K. GIBAYLO and B. UMSCHWEIF (Compt. rend. Soc. Biol., 125, 275—277).—From the $\text{CCl}_3\text{CO}_2\text{H}$ extract of bakers' yeast a polyphosphoric acid, probably $\text{H}_6\text{P}_4\text{O}_{13}$, has been obtained. H. G. R.

Preparation of hexose monophosphate from yeast extract. C. V. SMYTHE (J. Biol. Chem., 1937, 118, 619—625).—Details are given of a method involving the addition of a dye (rosinduline GG) (A., 1936, 759) to the fermentation mixture, whereby

a yield of 25 g. of a cryst. Ca salt is obtained from 250 g. of dried yeast. After removal of Ca glycerophosphate as a 1:1 mixture with hexose monophosphate, 20 g. of Ca hexose monophosphate are obtained; this product is a mixture of glucose, fructose, and mannose monophosphates.

P. G. M.

Fermentative determination of sugar in Warburg's apparatus. G. WEICHSEL (Planta, 1936, 26, 19—27).—The technique aims to reduce errors arising from non-uniformity of fermentative power of yeast cultures by introducing a control fermentation. A. G. P.

Carbohydrates of yeast. K. SILBEREISEN (Z. Spiritusind., 1937, 60, 124—126, 129—130).—A lecture.

Yeast mannan.—See A., II, 277.

Chemical factors influencing growth and pigmentation of certain micro-organisms. M. S. KHARASCH, E. A. CONWAY, and W. BLOOM (J. Bact., 1936, 32, 533—540).—Large consns. of biologically catalytic metals (Mn^{++} , Cu^{++} , Fe^{+++}) inhibit the growth of bacteria, yeasts, and fungi, whereas smaller consns. may cause loss of pigmentation. The toxic effect of Cu on sensitive organisms is counteracted by addition of liver extract to the medium. Fixation of metals by liver extract may cause inhibition of growth by restricting the supply of necessary metals to the organism. Development of pigment in cultures of *Serratia marcescens* does not specifically require glucose in the medium but depends on the presence in it of substances containing available $\cdot\text{CHO}$ or $\cdot\text{CO}$ groups. Pigmentation in many organisms is inhibited by NHPh_2 . A. G. P.

Physico-chemical characters of sexuality in fungi. P. JOYET-LAVERGNE (Protoplasma, 1936, 26, 1—19).—The chondriome of the male gamete shows higher oxidative power and constitutes a larger proportion of the cytoplasm than that of the female gamete. The fatty constituents of the female cell reduce osmic acid; those of the male cell do not. M. A. B.

Substitutes for potassium in metabolism of lower fungi. O. RAHN (J. Bact., 1936, 32, 393—399).—Rb can replace K in culture media for certain yeasts, mycobacteria, and aerobic sporing bacteria, but yields are diminished. Na, Li, or bivalent radioactive elements cannot serve as substitute for K. Gram-negative bacteria (except *Rhizobium*) can grow without K. The radioactivity of K is probably a factor in the growth of micro-organisms. A. G. P.

Production of fat by moulds and bacteria. W. SCHWARTZ (Angew. Chem., 1937, 50, 294—296).—The relations between conditions of culture and fat formation found by various authors are summarised. Generally, the factors which increase the yield of fat are: high C and N contents of nutrients, high temp., and a plentiful supply of O_2 . T. G. G.

Energy exchange in *Aspergillus niger* as influenced by the supply of potassium. A. RIPPEL and G. BEHR (Arch. Mikrobiol., 1936, 7, 315—322).—The energy consumption per g. of

mycelium was higher when the K supply was adequate than when it was deficient. A. G. P.

Acid production and acid-resistance of *Aspergillus niger*. H. KARDO-SYSSOJEVA (Zentr. Bakt. Par., 1936, II, 93, 264—277).—Media containing HCl affect the organism by (i) direct activation, (ii) after-effects which induce modification during prolonged subculturing, (iii) increasing the stability of active cultures which incline towards a spontaneous degeneration. Changes in morphological characteristics of a strain are reflected in modifications of acid-producing properties. A. G. P.

Aërobic decomposition of cellulose. L. M. HOROVITZ-VLASOVA (Zentr. Bakt. Par., 1936, II, 93, 347—358).—Various cellulose-decomp. organisms are isolated from soil. Of these, *Aspergillus spp.* were the most active and produced CO_2 and sol. substances (not sugars, aldehydes, acids, pentosans, or oxycellulose) which were utilisable by various bacteria. A. G. P.

Detoxication of sulphuric acid in cultures of *Aspergillus niger*. A. RIPPEL and G. BEHR (Arch. Mikrobiol., 1936, 7, 584—589).—In cultures of *A. niger* in which K is supplied as K_2SO_4 , 60% of the SO_4^{--} may be removed from the medium by the mould, especially in presence of much sugar. Autolysis of the mycelium yields large proportions of org. S. With KCl as K source no fixation of Cl' takes place. A. G. P.

Influence of zinc, iron, copper, and of combinations of these on the growth of *Aspergillus niger*. F. GOLLMICK (Zentr. Bakt. Par., 1936, II, 93, 421—442).—Although in general Zn favours the vegetative growth and Fe the fructification of *A. niger*, under certain conditions Zn, Fe, and Cu are similarly effective in increasing both vegetative growth and fructification. Fe^{II} and Fe^{III} are equally active. The inhibitory action of excessive amounts of Zn is partly counteracted by CaCO_3 . Fe lowers the toxicity of heavy Zn dosages in respect of fructification but increases it in respect of mycelial growth. Formation of the black spore pigment depends on an oxidation process which is catalysed by Cu. The toxic effects of Cd are diminished by high concns. of Fe. A. G. P.

Decomposition and utilisation of verbenaldehyde by *Aspergillus niger*. J. CHEYMOL (Bull. Soc. Chim. biol., 1937, 19, 460—465).—*A. niger*, grown in aq. verbenaldehyde, decomposes it into verbenalol and glucose, the latter being utilised and the former either remaining in solution or being adsorbed by the mycelium. E. A. H. R.

Nitrogen metabolism of a micro-organism from the viewpoint of the law of allometry. W. H. SCHOPFER (Compt. rend., 1937, 204, 1127—1129).—The law of allometry is applicable to the decline in N content of *Phycomyces* with advancing development, the level of development in experiments described being controlled by the amount of vitamin- B_1 given. The influence of varying levels of N supply is examined. A. G. P.

Vitamins and growth factors in plants. Activity of oxidation products of vitamin- B_1 .

W. H. SCHOPFER and A. JUNG (Arch. Mikrobiol., 1936, 7, 571—578).—Oxygenated H_2O destroys the activity of cryst. vitamin- B_1 towards *Phycomyces* and animals and also that of wheat germ towards *Phycomyces* and yeast. Thiochrome obtained by oxidation of $-B_1$ with $\text{K}_3\text{Fe}(\text{CN})_6$ has no action on animals and little or none on *Phycomyces*. $-B_1$ and bios cannot be separated by oxidation processes. A. G. P.

Presence of chitin in micro-organisms. M. SCHMIDT (Arch. Mikrobiol., 1936, 7, 241—260).—The chitin (I) content of various organisms is recorded. In Mucorineæ the (I) content in acid is $>$ that in alkaline media. The decrease in (I) during autolysis depends on the temp. and reaction of the medium; in acid media $\text{H}_2\text{C}_2\text{O}_4$ is produced. A. G. P.

Potassium permanganate as an aid to the production of asexual fructification by *Phytophthora erythroseptica*. Pethybr. R. McKAY (Nature, 1937, 139, 802).—The addition of small amounts of dil. aq. KMnO_4 accelerates the formation of conidia. L. S. T.

Phytoplankton in the Bay of Fundy and Gulf of Maine. H. H. GRAN and T. BRAARUD (J. Biol. Board Canad., 1935, 1, 279—467).—Variations with depth in P and NO_3' contents and O_2 saturation are examined in relation to photosynthetic activity of plankton and the possible influence of dam construction. CH. ABS. (p)

Metabolism of protozoa. III. Propertes of a proteolytic extract obtained from *Glaucoma piriformis*. N. R. LAWRIE (Biochem. J., 1937, 31, 789—798; cf. A., 1935, 1419).—A protease is isolated from the cells of *G. piriformis* and shown to contain a proteinase of the papainase group. The protease digests caseinogen, gelatin (optimum p_H 6), and α -glutelin readily and ovalbumin very slowly. It is activated slightly by CN' at p_H 7 but is inactivated by free HCN. The effects of concn. of enzyme and substrate, and duration of action, on the extent of proteolysis are investigated. P. W. C.

Action of small amounts of agar on growth and nitrogen fixation of *Azotobacter* and on other microbiological processes. A. I. VIRTANEN (Arch. Mikrobiol., 1936, 7, 488—489).—Observations similar to those of Rippel (this vol., 35) were previously recorded by Virtanen and Pulkki (A., 1933, 535). A. G. P.

Action of iron, agar, and humus on *Azotobacter*. A. RIPPEL (Arch. Mikrobiol., 1936, 7, 590—597).—Agar increases the action of FeSO_4 in stimulating the growth and N fixation of *A. chroococcum*. With addition of Mo this effect becomes $>$ that produced by humus preps. The action depends on the colloidal properties of the agar. A. G. P.

Influence of iron and molybdenum on nitrogen fixation by *Azotobacter chroococcum*. Beij. S. KRZEMIENIEWSKI and J. KOVATS (Bull. Acad. Polonaise, 1936, B, 169—195).—A strain of *A. chroococcum* showing poor N-fixing ability became much more active on addition of humus material or its ash. Neither NaMoO_4 nor Fe salts alone had any

appreciable effect but simultaneous treatment with both markedly increased the amount of N fixed.

A. G. P.

Metabolism of *Azotobacter chroococcum*. I. Variability of the oxidation-reduction system with cultures on different media. R. NILSSON (Arch. Mikrobiol., 1936, 7, 598—612).—*A. chroococcum* grown on glucose media contains much cozymase and in the course of fermentation probably utilises hexose diphosphate as H donator. In many respects the enzyme system resembles that of yeast. When cultured on glucose- and then transferred to mannitol-media *Azotobacter* grows at an accelerated rate and retains cozymase after repeated subculturing. The mechanism of the metabolic changes is discussed.

A. G. P.

Cell inclusions in *Azotobacter chroococcum*. Beij. A. BONAZZI (Science, 1937, 85, 385).—The results reported by Lewis (this vol., 146) are confirmed.

L. S. T.

Physiology of *Rhizobium*. VIII. Respiratory quotient. D. W. THORNE, O. R. NEAL, and R. H. WALKER (Arch. Mikrobiol., 1936, 7, 477—487; cf. A., 1936, 1559).—The R.Q. (24 hr. after inoculation) of *R. japonicum* and *R. leguminosarum* was < that of *R. meliloti*, *R. trifolii*, and *R. phaseoli* in glucose media and with 4 different N sources. No differences were apparent in media containing the same sources of N but no sugar. With yeast extract or asparagine as N source in glucose- or no-sugar-media, the R.Q. of all species was < when N was supplied as NaNO_3 or NH_4Cl . Yeast extract produced greater stimulation of growth and respiration than any other N source examined. Root-nodule organisms benefit from the action of reducing substances. A. G. P.

First stages of decomposition of cellulose by *Spirochaeta cytophaga*. M. S. LOICJANSKAJA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 381—384).—The first stage of decomp. is probably an oxidation to polyglycuronic acids. A. G. P.

Variability in the fire-blight organism *Erwinia amylovora*. P. A. ARK (Phytopath., 1937, 27, 1—28).—Differences in cultural characteristics and in ability to utilise nutrient materials among variants of *E. amylovora* are examined. Injection of asparagine into resistant or dormant plants facilitates subsequent infection. A. G. P.

Fermentation of glycerol by gluconic acid bacteria in fruits. Production of dihydroxyacetone, glyceric, acetic, glycollic, and succinic acids, and a substance which gives a reddish-violet colour reaction with ferric chloride. T. TAKAHASHI and T. ASAI (J. Agric. Chem. Soc. Japan, 1935, 11, 1008—1016).—The products of fermentation of glycerol (I) by *Gluconoacetobacter cerinus*, var. *ammoniacus* f. sp. unshu β , in yeast- CaCO_3 media are examined. (I) may be converted into an unknown keto-acid through $\text{CO}(\text{CH}_2\text{OH})_2$ or into succinic or glycollic acid through glyceric acid and AcOH.

CH. ABS. (p)

Fermentation products of acetic acid bacteria associated with fruits. Formation of galactonic and komenic acid from galactose. T. TAKAHASHI and T. ASAI (Zentr. Bakt. Par., 1936, II, 93, 248—

252).—These acids were produced from galactose by acetic bacteria isolated from fruits. A. G. P.

Nitrogenous nutrition of certain species of propionic acid bacteria. C. FROMAGEOT and E. L. PIRET (Arch. Mikrobiol., 1936, 7, 551—570).—*Propionibacterium zeæ*, *P. pentosaceticum*, and *P. Thonii* utilise N supplied as NH_4OAc in glucose media containing extract of polenta as an essential activator. *P. Freudenreichii*, *P. technicum*, and *P. Shermani* are unable to do so, probably through deficiency of a growth factor. Change of C source to AcCO_2H alters the relative rates of growth of the three first named organisms. With lactic acid as C source *P. pentosaceticum*, *P. zeæ*, and *P. Shermani* but not the other three species utilise NH_4OAc . No acidity develops in lactate or pyruvate media, EtCO_2Na , NaOAc , and CO_2 being produced. In glucose-polenta extract media *P. zeæ* does not utilise $(\text{NH}_4)_2\text{SO}_4$, $(\text{NH}_4)_2\text{CO}_3$, $(\text{NH}_4)_2\text{C}_2\text{O}_4$, NH_4NO_3 , or HNO_3 . Tryptophan, asparagine, and alanine serve as simultaneous sources of C and N for *P. zeæ* and growth (although < that obtained with glucose- NH_4OAc) under these conditions is unaffected by the presence of glucose.

A. G. P.

Influence of traces of oxygen on glycolysis by *Propionibacterium pentosaceum*. P. CHAIX (Compt. rend., 1937, 204, 911—913; cf. A., 1936, 248, 1561).—Removal, by P or CrCl_2 , of traces of O_2 , or addition of small quantities of HCN ($5 \times 10^{-5}M$), allows small quantities of these bacteria to metabolise glucose at the same rate as do larger quantities; O_2 is thus responsible for the inhibition previously observed when < min. amounts of these bacteria are used.

F. A. A.

Oxidation and fermentation of glucose by *Propionibacterium pentosaceum*. P. CHAIX (Compt. rend., 1937, 204, 1005—1008).—The CO_2 evolved under aerobic conditions is \times under anaerobic; in the former case, fermentation of glucose is diminished. Cystine, cysteine, and H_2S have no inhibitory effect on respiration, and HCN inhibits it only in concns. $>0.001N$. This effect is different from the oxidation of the glycolytic system of the organism (see above).

J. L. D.

(A) **Biochemistry of methane fermentation.** (B) **Methane-producing bacteria.** H. A. BARKER (Arch. Mikrobiol., 1936, 7, 404—419, 420—438).—(A) Bacterial production of CH_4 is effected by direct reduction of CO_2 in the presence of H donators, e.g., EtOH , BuOH , which are themselves converted into AcOH and PrCO_2H (I), respectively. (I) is further dehydrogenated to AcOH with additional formation of CH_4 . AcOH probably undergoes a similar dehydrogenation of the same type, the change being masked by the formation of CO_2 as the product of dehydrogenation.

(B) Four species of non-sporing CH_4 -producing bacteria are isolated and their biochemical activities are described.

A. G. P.

***Bacterium bifidum* and *Thermobacterium intestinale*.** S. ORLA-JENSEN, A. D. ORLA-JENSEN, and O. WINTHER (Zentr. Bakt. Par., 1936, II, 93, 321—343).—The cultural characteristics and ferment-

ative activities of these organisms together with their distribution in faeces are examined. A. G. P.

Bacterial growth at constant p_H . Apparent oxidation-reduction potential, acid production, and population studies of *Lactobacillus acidophilus* under anaerobic conditions. L. G. LONGSWORTH and D. A. MACINNES (J. Bact., 1936, 32, 567—585).—The essential character of CO_2 for growth of the organism under anaerobic conditions is confirmed. During growth E_h decreases and ultimately attains a const. val. which is characteristic of the species. Maintenance at p_H 6 in cultures results in a 4-fold increase in bacterial nos. and a 9-fold increase in acid production. Au electrodes are more sensitive than Pt electrodes to E_h changes in these systems.

A. G. P.

Influence of the composition of the medium on the metabolism of some slow lactose-fermenting bacteria of intestinal origin. A. D. HERSHEY and J. BRONFENBRENNER (J. Bact., 1936, 32, 519—531).—Rates of multiplication and lactose (I) decomp. by these organisms are markedly influenced by the concn. of (I) in the medium. Presence of Na succinate as supplementary source of C does not influence the early fermentation of (I) except by its buffer action. Succinic acid (II) is removed from the medium more rapidly as the ratio of the concns. of (II) : (I) is increased.

A. G. P.

Symbiotic function of *Oidium lactis*. J. B. LINNEBOE and E. G. HASTINGS (Zentr. Bakt. Par., 1936, II, 93, 278—290).—Undesirable odours produced in milk by *O. lactis* are influenced by symbiotic relationships between this and other organisms, notably *B. mesentericus*. This symbiosis results in a decrease in the $[H^+]$ of the medium and is attributed to the proteolytic and acid-consuming activities of *Oidium*. Changes in oxidation-reduction potential and the increase in protein decomp. vary with the nature of the bacteria concerned.

A. G. P.

General and biochemical characters of forty strains of mucous bacteria. LEVY-BRUHL and Y. CADO [with HURI] (Ann. Inst. Pasteur, 1937, 58, 498—530).—The morphology and physiology of capsule-forming bacteria of the *Klebsiella* and *Aerobacter* type are described. Unusual features demonstrated for certain strains are autolysis, chromogenesis, motility, gelatin liquefaction, bipolar staining, and marked size variation. Some strains are capable of using NH_4 salts as N source, and some can use EtOH or AcOH as source of C.

L. D. G.

Production of mucilage by bacteria. I. Classification of Natto-bacillus. Y. GO and S. NAKAMURA (Bull. Agric. Chem. Soc. Japan, 1937, 13, 295—304).—Fifty-two strains of Natto-bacillus have been classified. Their ability to produce mucilage was determined by measurement of the viscosity of culture media of soya-bean extracts.

J. N. A.

Metabolism of Thiorhodaceæ. C. B. VAN NIEL (Arch. Mikrobiol., 1936, 7, 323—358).—Thiorhodaceæ do not liberate O_2 during photosynthesis and like Athiorhodaceæ utilise H_2 and org. substances in the assimilation process. Production of H_2S by Thiorhodaceæ in the dark is small; it depends on the

amount of S stored in cells and is attributable to phytochemical reduction. In media containing sufficient $NaHCO_3$ to maintain a slightly alkaline reaction, lower fatty acids [up to $EtCO_2H$ (I)] are immediately assimilated; this occurs only in the presence of inorg. salts. Assimilation of CO_2 in the presence of (I) is facilitated by $S_2O_3^{2-}$ but not by SO_4^{2-} . Production of acid by Thiorhodaceæ occurs both in darkness and in light.

A. G. P.

Enzyme formation in bacteria. J. H. QUASTEL (Enzymologia, 1937, 2, 37—42).—The relative endocellular enzymic contents of *M. lysodeikticus* and their variations with nutrition are investigated, using suspensions of the bacteria lysed by egg-white. Urease content is high in a medium rich in glucose (I), but low in one containing urea. (I) diminishes, whilst urea increases, catalase activity. Fumarase formation may be retarded by the presence, in the medium, of its substrate. The classification of adaptive and constitutive enzymes is inadequate to explain these results.

E. A. H. R.

Changes in electrokinetic potential of bacteria at various phases of the culture cycle. L. S. MOYER (J. Bact., 1936, 32, 433—464).—Electrophoretic mobilities of R and S forms of *Escherichia coli* are examined. In buffers of const. ionic concn. no differences of mobility of the S form occurred between p_H 4.0 and 7.0. Bacterial surfaces are subject to the physico-chemical principles which govern non-living surfaces.

A. G. P.

(A) Growth-promoting and -inhibiting substances present in brilliant-green-bile media. (B) Increased growth and gas production by *Escherichia-Aerobacter* organisms in brilliant-green-bile media containing sodium formate. C. N. STARK and L. R. CURTIS (J. Bact., 1936, 32, 375—384, 385—391).—(A) The counter-effects of brilliant-green (I) (inhibitory) and of bile salt (II) (stimulatory) on certain bacterial cultures are examined. Protein material, e.g., milk, lowered the inhibitory effect of (I). The bearing of the results on bacterial tests of milk are discussed.

(B) The customary (I)–(II) medium does not eliminate all organisms which vitiate results of bacteriological examination of H_2O or milk. Addition to the medium of 0.5% of HCO_2Na increased the rate of growth of *Escherichia-Aerobacter* organisms, the no. of organisms developing, and the rate and amount of gas production without materially affecting the growth of organisms which produce false tests.

A. G. P.

Sugar alcohols. VI. Utilisation of sugar alcohols and their anhydrides by various micro-organisms. K. P. DOZOIS, C. J. CARR, J. C. KRANTZ, jun., F. HATCHEL, and F. F. BECK (J. Bact., 1936, 32, 499—503; cf. A., 1936, 113).—Further confirmation is given for the observation that the formation of the anhydride from sugar alcohols prevents their utilisation by many *coli-aerogenes* organisms. Polygalitol (1 : 5-anhydromannitol) is an exception to this rule. The inability of "intermediates" to ferment propylene glycol may permit differentiation of this group of organisms from *Escherichia* and *Aerobacter*.

A. G. P.

Influence of halogenated acetic acids on the decomposition of hexose by *Bacterium coli*. M. MICHAELIS (Suomen Kem., 1937, 10, B, 10—12).—The inhibitory action of the acids on *B. coli* in glucose media at p_H 7.6 was in the descending order $CH_2I \cdot CO_2H$, $CH_2Br \cdot CO_2H$, $CH_2Cl \cdot CO_2H$. The limiting concns. of the acids affecting the growth of the organisms are the same as those affecting fermentation. The effect of the acids on the proportion of acid products of fermentation is examined. A. G. P.

Spontaneous agglutination of *B. coli*. G. MAGHERU, A. MAGHERU, and E. BARBULESCU (Compt. rend. Soc. Biol., 1937, 125, 310—312).—Agglutination is a min. in 0.7% aq. NaCl at p_H 7.3. H. G. R.

Lethal dose of toxins of some anaerobes for sheep. J. H. MASON (Onderstepoort J. Vet. Sci., 1935, 5, 61—64).—Data are given for the toxins of *Clostridium septique*, *Cl. oedematiens*, *Cl. ovitoxicus*, and *Cl. welchii*, in respect of mice and sheep.

CH. ABS. (p)

(A) Serologic agglutination of the obligate anaerobes, *Clostridium paraputrificum* (Biestock) and *C. capitovalis* (Snyder and Hall).

(B) Mechanism of the non-specific serum agglutination of these anaerobes. M. L. SNYDER (J. Bact., 1936, 32, 401—410, 411—422).—(A) The two organisms are serologically distinct. Non-sp. acid agglutinations occurred when glucose (I) broth cultures having terminal $p_H < 5.0$ were used.

(B) Non-sp. serum agglutination of (I) broth cultures of *C. paraputrificum* results from the action of acid produced by fermentation of (I) flocculating a substance in the broth which in turn entrained the bacteria. Agglutination of broth cultures in presence of H_2SO_4 (1:10) occurs at p_H 5.1 and in aq. suspensions at 3.01—3.02. Non-sp. reactions are avoided by use of neutral broth or of physiological saline suspensions. A. G. P.

Metabolism of various types of sugars by *S* and *R* forms of pneumococcus. P. FINKLE (J. Bact., 1936, 32, 473—483).—Respiratory oxidation of fructose (I) by *S* forms was $>$ that of other sugars examined. Conversion of virulent into non-virulent types is associated with diminution in rate of oxidation of (I). In *R* III forms sugar oxidation was most rapid in the case of maltose. Rates of glycolysis of (I) by types I and II was $>$ that by III. Glucose was the most easily glycolysed sugar in the case of types III and *R* II, and (I) in the case of *R* I and *R* III. A. G. P.

***Streptococcus cremoris*.** E. S. YAWGER and J. M. SHERMAN (J. Dairy Sci., 1937, 20, 205—212).—*S. cremoris* can be differentiated from *S. lactis* by the inability of the former either to produce NH_3 in 4% peptone, or to grow in the presence of 4% NaCl at 40° or in broth at p_H 9.2. It is also less tolerant to 0.3% methylene-blue than *S. lactis*. Other characteristics are also given. W. L. D.

Identification of streptococcus of mastitis in milk. W. L. WILLIAMS (Amer. J. Publ. Health, 1937, 27, 453).—About 90% of streptococcus strains causing bovine mastitis are *S. agalactiae*. The main cultural characteristics are: hæmolysis on blood

agar, acidity and bleaching from the bottom in litmus milk, no effect on aesculin, hydrolysis of Na hippurate, and rough growth in broth. W. L. D.

Growth and fermentation of bacteria near their minimum temperature. M. J. FOTER and O. RAHN (J. Bact., 1936, 32, 485—497).—In milk heavily infected with streptococci lactic fermentation occurs at 0° although at reduced rates. The diminution in rate of this fermentation is most marked in the species which do not grow at 0°. Among such species *S. lactis* shows decreasing enzyme activity during storage (4—8 weeks) and regains normal fermentative capacity only after a no. of generations have been grown. *S. faecalis*, which multiplies at 0°, is not thus affected. Acid production was lowest at 0° with all species and increased with rising temp. Differences between species in this respect are not wholly attributable to deterioration of enzymes. Lactose consumption per unit cell increase varies considerably with the species, is const. for individual species at low and medium temp., and increases as optimum temp. is approached. A. G. P.

Dynamics of fibrinolysin production by streptococci. R. R. MADISON and J. D. TARANIK (Proc. Soc. Exp. Biol. Med., 1937, 36, 1—3).—Routine clinical tests of broth cultures of *S. hæmolyticus* older than 12 hr. lead to erroneous conclusions as to their fibrinolysin content. P. G. M.

Nutrition of *Staphylococcus aureus*. Nicotinic acid and vitamin- B_1 . B. C. J. G. KNIGHT (Biochem. J., 1937, 31, 731—737).—*S. aureus* can be grown aerobically on a medium containing NH_2 -acids and glucose together with a supplement (yeast concentrate or the high-vac. distillate derived from it) which is replaceable by nicotinic acid (I) + vitamin- B_1 . Neither (I) nor $-B_1$ alone is effective in rendering growth possible. Evidence is given that (I) is present in most active preps. of *S. aureus* growth factor. P. W. C.

Absorption of staphylococcus bacteriophages. M. L. RAKIETEN, T. L. RAKIETEN, and S. DOFF (J. Bact., 1936, 32, 505—518).—Susceptible cultures of staphylococci furnish extracts which inhibit bacteriophage. The susceptibility of the culture to the phage is related to the ability of an extract of the culture to inactivate bacteriophage. Extracts are heat-stable but lose ability to inactivate phage on filtration through bacterial filters and on pptn. by homologous anti-sera. Heat-killed or autoclaved cultures of susceptible organisms absorb phage. A. G. P.

Chemiluminescence. J. G. EYMERS (Chem. Weekblad, 1937, 34, 312—314).—Previous work on chemiluminescence in gas and liquid phases and on bioluminescence is reviewed. The light emitted in various bioluminescent phenomena is very similar. In the oxidation of luciferin by O_2 in presence of luciferase by light bacteria, two broad absorption bands symmetrically disposed about $\nu = 18,200$ and $20,300\text{ cm}^{-1}$, respectively, are observed, whilst the fluorescence spectrum of lactoflavin shows a single broad band at $\nu = 18,200\text{ cm}^{-1}$. Oxidation of dimethylacridinium nitrate also gives bands at

$\nu = 18,200$ and $20,250 \text{ cm}^{-1}$ and 3-aminophthalhydrazide at $\nu = 20,300$ and $21,250 \text{ cm}^{-1}$. The fluorescence spectra of the culture medium in which *B. pseudomonas putida* has been grown and of extracts of luciferin and luciferase from *Cypridina* also show the band at $\nu = 18,200 \text{ cm}^{-1}$ with bands at $20,800$ and $21,200 \text{ cm}^{-1}$, respectively. S. C.

Influence of salts on light emission of marine bacteria. F. BUKATSCH (Chem.-Ztg., 1937, 61, 309).—Glutamic acid (I), alanine, and leucine (0.01–0.05%) provided favourable sources of N for the development of luminous bacteria (cf. Mudrak, A., 1933, 1334). With (I) Na salts are essential in the culture media and K also appeared to be necessary. Sulphates of Cu, Zn, Fe, and Mn (0.01–0.0001%) stimulated light evolution from the cells without increasing their no., but when CaCl_2 was also added development took place. Ca may retard the entry of poisonous Cu etc. into the protoplasm. Sr and Ba were less effective. S. M.

Determination of indole in bacterial cultures. E. MACCHIA (Diagnostica tec. lab. Napoli, 1935, 6, 752–757).—The washed Et_2O extract of the culture is treated with AcOH , a 1% solution of $p\text{-NMe}_2\text{-C}_6\text{H}_4\text{-CHO}$ in EtOH , and sulphosalicylic acid (20%). On evaporation of the Et_2O a reddish-violet colour indicates indole and a blue colour skatole. The colours are compared with standards. CH. ABS. (p)

Re-development of colour in leuco-derivatives by nitrates in presence of bacteria. E. AUBEL, O. SCHWARZKOPF, and GLASER (Compt. rend. Soc. Biol., 1937, 125, 223–224).—If reduction of the NO_3^- is inhibited by KCN etc., only a slight development of colour is observed. H. G. R.

Formation of organo-metalloidal and similar compounds by micro-organisms. V. Methylated alkyl sulphides. Fission of the disulphide link.—See A., II, 271.

Metabolism of the filter-passing organism C from sewage. A. PRIE (Brit. J. Exp. Path., 1937, 18, 96–102).—Blood assists only aerobic growth of the organism. Under aerobic conditions NH_3 , $\text{NH}_2\text{-N}$, and reducing sugar in the medium are unaltered but added glucose (I) is utilised to varying extents according to the amount of blood present. Anaerobically, with or without blood, $\text{NH}_2\text{-N}$ and (I) are unaltered but NH_3 increases. Dehydrogenase vals. for isolated organism on various substrates are tabulated. Hæmin is necessary for the oxidation of (I) but does not affect respiration in (I)-free peptone. Hæmin is rapidly destroyed. 3–4 O are consumed per mol. of (I) metabolised. CN^- inhibits, but flavin, flavoprotein, and cytochrome-C do not influence, respiration. Organisms grown anaerobically show extra O uptake on entering aerobiosis. R. M. M. O.

Metabolism of filter-passing organism A from sewage. B. HOLMES (Brit. J. Exp. Path., 1937, 18, 103–107).—Methylene-blue is reduced as rapidly with lactate as with glucose (I). The organism can grow on peptone (II) alone but growth is assisted by blood both aerobically and anaerobically.

Oxidisable substances in (II) are gradually used up. Disappearance of (I) cannot be demonstrated. NH_3 is never produced. R. M. M. O.

Centrifugation studies. III. Viruses of foot-and-mouth disease and vesicular stomatitis. W. J. ELFORD and I. A. GALLOWAY (Brit. J. Exp. Path., 1937, 18, 155–161).—Sedimentation rates indicate a diameter about $70 \text{ m}\mu$ for the vesicular stomatitis virus, in agreement with ultrafiltration observations. The val. obtained for foot-and-mouth virus is $20 \text{ m}\mu$, nearly twice the ultrafiltration val. The larger size is probably more correct. The particles of each virus are probably uniform in size. R. M. M. O.

Measurement of the size of viruses by high-speed centrifugalisation. J. MCINTOSH and F. R. SELBIE (Brit. J. Exp. Path., 1937, 18, 162–174).—Details of an air-driven centrifuge are given. When the final concn. of organisms in the supernatant fluid is plotted as a power of 10 against time of spinning, a straight line is obtained the angle made by which with the horizontal (sedimentation angle) can be used to characterise the organism. Vals. thus obtained are $>$ those previously determined by filtration methods. The d of particles is determined by sedimenting in various fluids. R. M. M. O.

Air-borne plant virus. (A) J. CALDWELL. (B) K. M. SMITH (Nature, 1937, 139, 761, 761–762).—A criticism (cf. this vol., 227) and a reply. L. S. T.

Structure types of protein "crystals" from virus-infected plants. J. D. BERNAL and I. FANKUCHEN (Nature, 1937, 139, 923–924; cf. this vol., 71).—Diagrams indicating the structure of the so-called cryst. virus protein prepared by the method of Stanley and Wyckoff are reproduced. The long mols. of the protein are packed with a perfect hexagonal two-dimensional regularity at right angles to their length, but there is no regularity of mol. arrangement in the direction of their length. The mol. is made up of piles of sub-mols. $22 \times 20 \times 20 \text{ \AA}$, somewhat smaller than the normal protein mol., and themselves divided into nearly identical groups with half these dimensions. Relative intensities of intermol. reflexions from various tobacco and cucumber viruses are given, and indicate the possibility of a system of classification of viruses on the basis of their X-ray patterns. L. S. T.

Acquired immunity against the "Y" potato virus. R. N. SALAMAN (Nature, 1937, 139, 924–925).—The prep. of an attenuated form of virus which affords complete protection to tobacco plants and partial protection to potato plants is described. L. S. T.

Bunchy-top disease of tomato. A. P. D. MCCLEAN (Union S. Africa Dept. Agric. Sci. Bull., 1935, No. 139, 46 pp.).—In aq. extracts the virus was killed by heating at $>70^\circ$ for 10 min. 30% EtOH did not cause appreciable loss of infectivity in 1 hr. Higher concns. were injurious. CH. ABS. (p)

Preparation of virus-proteins by ultracentrifuging. R. W. G. WYCKOFF (Compt. rend. Soc. Biol., 1937, 125, 5–7).—The protein of tobacco mosaic

disease, cryst. by means of the ultracentrifuge, has a mol. wt. $\sim 17 \times 10^6$. That of infectious papilloma of rabbits has a slightly greater mol. wt. and is present in infected tissue at a concn. of 0.05%. H. G. R.

Toxoplasma and obligate intracellular parasitism. A. B. SABIN and P. K. OLITSKY (Science, 1937, 85, 336—338).—Results obtained with toxoplasma, the causative agents of various pathological conditions in birds and mammals, are summarised. As a result of their apparent obligate intracellular parasitism, these parasites have many features in common with certain ultra-microscopic viruses.

L. S. T.

Sonic energy as a lethal agent for yeast and bacteria. T. D. BECKWITH and C. E. WEAVER (J. Bact., 1936, 32, 361—373).—Supersonic treatment (quartz crystal) killed certain yeasts and bacteria, diminished the no. of viable spores in suspensions, but had no influence on agglutinin or bacteriophage. Germicidal action is prevented by protein but not by lipin solutions.

A. G. P.

Action of wine on pathological organisms of man. W. DIETZE (Zentr. Bakt. Par., 1936, II, 93, 252—264).—The bactericidal activity of white was > that of red wines. It is attributable to the joint action of EtOH and acids.

A. G. P.

Bactericidal and photochemical properties of irradiated cod-liver oil and an ozonide of olive oil. F. A. STEVENS (J. Bact., 1936, 32, 47—55).—Fogging of photographic plates and the bactericidal effects of irradiated cod-liver oil and the ozonide of olive oil are due to substances liberating active O_2 . Sublethal doses of the active O_2 from these oils retard growth of bacteria or may cause dissociation.

A. G. P.

Bactericidal and photochemical properties of irradiated petrolatum and mineral oil. F. A. STEVENS (J. Lab. Clin. Med., 1935, 21, 26—30).—The activity is due to peroxides and aldehydes.

CH. ABS. (*r*)

Bactericidal properties of acraldehyde. R. E. VOLLRATH, L. WALTON, and C. C. LINDEGREN (Proc. Soc. Exp. Biol. Med., 1937, 36, 55—58).—The bactericidal properties of garlic towards *B. coli* and *B. subtilis* are due to the presence of acraldehyde and not to the sulphides.

P. G. M.

Cold sterilisation of nutrient media and its importance for the pure culture of micro-organisms. G. SCHWEIZER (Arch. Mikrobiol., 1936, 7, 297—314).—Apparatus for cold vac. sterilisation is described and various sterilising agents are examined.

A. G. P.

Testing bacteria-proof filters. B. V. JILLINGS (Pharm. J., 1937, 138, 553).—The filtrate passing a candle etc. drops into a sterile bottle containing a nutrient agar medium. Any leak is then detected on incubating.

P. W. C.

Effect of adrenaline on glucose excretion in fasted depancreatized dogs. W. H. BACHRACH, W. B. BRADLEY, and A. C. IVY (Amer. J. Physiol., 1936, 117, 203—205).—The increase in glucose (I) excretion is never > the total possible amount of (I) that can be derived from muscle-glycogen (II), pro-

T (A., III.)

teins, and glycerol, and in most cases can be accounted for by (II) alone.

R. N. C.

Separation of adrenaline from solution or from adrenal glands by electrophoresis. N. I. GAVRILOV and A. M. KRASHNIKOV (Sci. Rep. Moscow State Univ., 1934, No. 3, 273—275).—Adrenaline is deposited at the cathode in the electrophoresis of its solutions, or of suspensions of adrenal gland in aq. AcOH, using a current of 0.002 m.amp. per sq. cm. Deposition does not take place when the glands are not absolutely fresh.

R. T.

Adrenal cortex hormone, ascorbic acid, and amino-acids in experimental hyperthyroidism. C. OEHME (Arch. exp. Path. Pharm., 1937, 184, 558—572).—Adrenal cortex hormone (cortidyn) decreases the increased metabolism in guinea-pigs due to thyroxine (I), decreases the loss of liver-glycogen and prolongs the life of guinea-pigs and mice in chronic (I) poisoning. Ascorbic acid (20—30 mg.) and glycine (10 mg. per 100 g.) have a similar but quantitatively different effect on the increased metabolism of hyperthyroidism. Prolonged administration of glycine and alanine decreases the normal metabolism by 10—20% in guinea-pigs, rats, and rabbits. The duration of life in hyperthyroidism is not changed by alanine, glucose, or NaI.

P. W. C.

Behaviour of the adrenals in experimental hyperthyroidism. E. KADEN, C. OEHME, and K. WEBER (Arch. exp. Path. Pharm., 1937, 184, 573—579).—The hypertrophy of the adrenals on repeated injection of thyroxine can be brought about by quite small doses (0.5×10^{-6} g. per 100 g.) and the effect cannot be due to the action on total metabolism. Cortidyn inhibits or decreases the increase of the adrenals. The effect is connected in some way with the pituitary.

P. W. C.

Blood-sugar of the adrenalectomised dog. W. M. PARKINS, H. W. HAYS, and W. W. SWINGLE (Amer. J. Physiol., 1936, 117, 13—23).—Blood-sugar (I) in the healthy adrenalectomised dog from which cortical hormone (II) has been withheld shows no significant deviation from the normal, but shows sharp and variable falls in traumatised or single-stage-adrenalectomised animals when in collapse; adrenaline restores (I) to normal or > normal without affecting the shock symptoms. Large amounts of (II) do not affect (I) in any of the above types of animal. Intraperitoneal injections of isotonic glucose induce shock and collapse, followed by death with (I) > normal unless (II) is given. The adrenalectomised bitch in oestrus (pseudopregnancy) is maintained in normal health for 40—60 days without (II), during which time (I) is generally > normal. (II) *per se* is apparently not concerned in carbohydrate metabolism in so far as this is reflected by (I). Hypoglycæmia has no significance in adrenal insufficiency in the dog.

R. N. C.

Partial synthesis of a crystallised compound with the biological activity of the adrenal-cortical hormone. M. STEIGER and T. REICHSTEIN (Nature, 1937, 139, 925—926; cf. A., 1937, II, 105).—21-Hydroxyprogesterone (I), m.p. 136—138°, prepared from stigmasterol, has a definite cortical activity on

adrenalectomised dogs and rats, and is the first such substance to be prepared from inactive material. (I) probably differs from corticosterone only by the absence of the fourth O. L. S. T.

Bio-assay of adrenal cortical extract: direct comparison of rat and dog units. G. F. CARTLAND and M. H. KUIZENGA (*Amer. J. Physiol.*, 1936, 117, 678—685). R. N. C.

Carbon monoxide and the anterior lobes of the pituitary. F. KAMPELMANN and E. SCHULZE (*Arch. exp. Path. Pharm.*, 1937, 184, 152—155).—CO activates guinea-pig thyroid and decreases the thyrotropic hormone content of the anterior lobes of the pituitary. P. W. C.

Antiluteogenic factor in the anterior pituitary. J. FREUD (*Nature*, 1937, 139, 880—881).—Experimental evidence for such a factor is presented. L. S. T.

Gonadotropic hormone of the anterior pituitary gland and creatinuria. I. I. NITZESCU and I. GONTZEA (*Compt. rend. Soc. Biol.*, 1937, 125, 80—81).—Injection of prolan decreases the excretion of creatine and creatinine and also increases the tolerance to exogenous creatine. H. G. R.

Adrenotropic principle of the pituitary in relation to lactation. E. T. GOMEZ and C. W. TURNER (*Proc. Soc. Exp. Biol. Med.*, 1937, 36, 78—80).—Cessation of lactation following hypophysectomy in the guinea-pig is probably due to withdrawal of lactogenic, adrenotropic, and carbohydrate metabolism hormones. P. G. M.

Effect of thyroxine and galactin on lactation in hypophysectomised guinea-pigs. E. T. GOMEZ and C. W. TURNER (*Proc. Soc. Exp. Biol. Med.*, 1937, 36, 80—81).—Neither Na thyroxine nor galactin, separately or in conjunction, can resuscitate milk secretion in hypophysectomised guinea-pigs. P. G. M.

Inhibition of the gonadotropic activity of the human pituitary by antiserum. I. W. ROWLANDS and A. S. PARKES (*Lancet*, 1937, 232, 924—926).—Prolonged treatment of a goat with pregnyl, a pregnancy urine extract, resulted in its serum being able to neutralise in rats and rabbits the effect of the original antigenic extract and the gonadotropic activity of human anterior pituitary. L. S. T.

Augmentation of the gonad-stimulating action of pituitary extracts by inorganic substances, particularly copper salts. H. L. FEVOLD, F. L. HISAW, and R. GREEP (*Amer. J. Physiol.*, 1936, 117, 68—74).—Cu⁺⁺, Zn⁺⁺, yeast extract (I), and yeast ash augment the action of follicle-stimulating hormone (II), with or without luteinising hormone (III), on the ovaries of immature rats. Zn⁺⁺ augments the action of (II), or (II) and (III), in hypophysectomised rats, but Cu⁺⁺ is without effect if (III) is absent. (I) and Cu⁺⁺ cause ovulation in mature rabbits, but Zn⁺⁺ has no effect. Zn⁺⁺ probably decreases the rate of absorption of active material; Cu⁺⁺ may catalyse the synergistic interaction of (II) and (III) in ovarian development. R. N. C.

Rationalisation of the method of biological assay for the corpus luteum hormone. J. T.

CHRISTENSEN (*Quart. J. Pharm.*, 1937, 10, 52—58).—Young rabbits are used with a modification of Clauberg's method (A., 1932, 656), the potency of a dose being related to the no. of animals in a group which show a response > a given submax. standard. R. M. M. O.

Action of corpus luteum hormone on the human menstrual cycle. T. N. MORGAN and S. G. DAVIDSON (*Lancet*, 1937, 232, 861—864).—Excision of the corpus luteum is followed within 48 hr. by menstruation. Injection of proluton, a substance having the action of the corpus luteum hormone, before and after excision may cause delay in the onset of menstruation, which is not delayed, however, in normal women. The onset of normal menstruation may not be determined solely by degeneration of the corpus luteum. L. S. T.

Ovarian hormone threshold for experimental menstruation in monkeys. E. ALLEN, A. W. DIDDLE, T. H. BURFORD, and W. M. GARDNER (*Amer. J. Physiol.*, 1936, 117, 381—392). R. N. C.

β-Estradiol.—See A., II, 289.

Action of testosterone propionate on normal adult female rats. V. KORENCHESKY, M. DENNISON, and K. HALL (*Biochem. J.*, 1937, 31, 780—785; cf. A., 1936, 644).—Prolonged injections of large doses of testosterone propionate into adult female rats suppressed the appearance of normal oestrus, and had a powerful stimulating effect on the uterus, vagina, and preputial glands and, to a smaller extent, on the mammary gland. The histological changes resemble those during pregnancy. A considerable increase in the rate of involution of the thymus, slight increase in wt. of the kidneys, and decrease of fat deposition also occur. The sexual hormones are classified into three groups on the basis of their male and female sexual activities. P. W. C.

Antagonism between testosterone and folliculin. P. GLEY and J. DELOR (*Compt. rend. Soc. Biol.*, 1937, 125, 52—54).—Testosterone inhibits the action of the gonadotropic hormone on the immature ovary and so prevents secretion of folliculin. H. G. R.

Relationship of the synthetic male hormone, androstenedione, to the protein and energy metabolism of castrate dogs, and the protein metabolism of a normal dog. C. D. KOCHAKIAN and J. R. MURLIN (*Amer. J. Physiol.*, 1936, 117, 642—657).—Protein metabolism in castrate male dogs is decreased by injection of androstenedione (I), N retention being borne by urinary urea. The daily max. N retention and the amount of hormone necessary to cause this effect \propto body-wt., and are the same for urinary male hormone and (I). Non-protein- and urea-N in the blood may fall, but never rise. Energy metabolism is not affected, nor is protein metabolism in normal animals. R. N. C.

Action of insulin on gastric secretion in normal and diabetic men. G. LOLLÍ (*Boll. Soc. ital. Biol. sperim.*, 1937, 12, 45).—Insulin (I) stimulates gastric secretion in normal and hyperchlorhydric men but not in diabetics, in one of whom a blood-sugar level of 0.06% contra-indicated the view that (I) causes

gastric hypersecretion by the hypoglycæmia produced. Ingestion of soup, however, stimulates the secretion in diabetics. F. O. H.

Action of insulin on muscle-glycogenolysis in the dog. M. POLONOVSKI, G. BIZARD, and H. WARRENBURG (Compt. rend., 1937, 204, 1090—1092).—Using the hind limb of a dog with only the sciatic nerve and the femoral vein and artery intact, total interruption of the blood supply led to hypoglycæmia. Injection of insulin (I) into the femoral artery led after 15 min. to a hyperglycæmia which after 45 min. was replaced by a hypoglycæmia > that without (I). When NaF was introduced before (I), the hyperglycæmia was maintained after 15 min. and was even greater if PO_4''' buffer of p_H 7.32 was administered with the NaF. P. W. C.

Effect of intravenous administration of protamine-insulin. B. B. LONGWELL and A. RAVIN (Amer. J. Physiol., 1936, 117, 453—456).—The action differs little from that of regular insulin. The prolonged effect after subcutaneous injection is confirmed. R. N. C.

Modification in the action of insulin by the addition of a colloidal suspension (gelatin). D. BROWN (Compt. rend., 1937, 204, 1015—1016).—The hypoglycæmic effect of insulin is intensified and the period occupied in restoring the blood-sugar to the original level is much increased by administration in 1% aq. gelatin. J. L. D.

Histone combinations of the protein hormones. F. BISCHOFF (Amer. J. Physiol., 1936, 117, 182—187).—Thymus histone (I) ppts. insulin (II) on the alkaline side of the isoelectric point of (II). The complex is approx. of the same potency as the original (II) when given intravenously, but relatively less potent when given intramuscularly. In larger doses it causes prolonged hypoglycæmia without shock. (I) ppts. relatively inactive material from prolan or pituitary gonadotropic preps. (III) at p_H 6.0—8.0, leaving an active filtrate. When assayed in the conventional manner, (I) produces a decrease in the activity of (III) by combining with the (III)-adsorbing proteins; addition of Zn^{++} prevents this action. R. N. C.

Simon's method for determination of the hypercalcæmic action of parathyroid hormone. E. CUBONI (Boll. Soc. ital. Biol. sperim., 1936, 11, 1019—1021).—Simon's method (A., 1935, 539) can be used with rats as test animals. F. O. H.

Rôle of the thyroid in the calorogenic action of vitamin-D. H. DEUTSCH, C. I. REED, and H. C. STRUCK (Amer. J. Physiol., 1936, 117, 1—5).—Complete thyroparathyroidectomy in dogs causes a decrease in metabolic rate correlated with loss of wt., both recovering simultaneously. Large doses of vitamin-D do not increase the metabolic rate as in normal dogs. The effect of -D is not due to an action on the parathyroids. R. N. C.

Mutual action of dinitrophenol-thyroxine and methylene blue-thyroxine in the isolated perfused dog's leg. N. ALWALL and I. SCHEFF-PFEIFER (Arch. exp. Path. Pharm., 1937, 184, 296—

304).—Whereas addition of thyroxine to the blood perfusing the isolated dog's hind leg causes increased oxidation but does not increase the action of dinitrophenol (I), it causes in isolated limbs of animals fed on thyroid an increase of the oxidation effect of both (I) and of methylene-blue (II). The effect in the latter case is thus the same as in the intact animal. The mechanisms of the actions of (I) and (II) are probably the same. P. W. C.

Action of arsenious acid on the thyroid and anterior lobes of the pituitary. F. KAMPELMANN (Arch. exp. Path. Pharm., 1937, 184, 139—151).—After administration of small amounts of As_2O_3 to rats for 20 days, inhibition of the thyroid could be detected histologically, due probably to decreased production of the thyrotropic hormone of the anterior lobes of the pituitary. P. W. C.

Effect of experimental hyperthyroidism on carbohydrate metabolism. I. A. MIRSKY and R. H. BROH-KAHN (Amer. J. Physiol., 1936, 117, 6—12).—Thyroid fed to rabbits increases utilisation of carbohydrate by the extrahepatic tissues. This is not due to defects in the glycogenic or glycolytic mechanism of the liver, since it occurs in eviscerated animals. The similarity between the syndromes of hyperthyroidism and diabetes may be due to the accelerated glycogenolysis that is common to both conditions. R. N. C.

Blood-protein, -lipin, and -cholesterol and protein:lipin ratio in the hyperthyroxinised animal. C. I. PARHON and I. ORNSTEIN (Bull. Soc. Chim. biol., 1937, 19, 508—510).—There is a slight increase in the lipin, fatty acid, cholesterol, and protein contents of blood, and a slight increase in the protein:lipin ratio, in hyperthyroxinised dogs. E. A. H. R.

Relation of pancreatic juice to the fatty infiltration and degeneration of the liver in the depancreatized dog. J. VAN PROHASKA, L. R. DRAGSTEDT, and H. P. HARMS (Amer. J. Physiol., 1936, 117, 166—174).—Withdrawal of pancreatic juice from the intestines of dogs does not cause fatty degeneration and infiltration of the liver. Oral administration of fresh pancreatic juice does not have the beneficial effect resulting from raw pancreas feeding. Hence the effect is not due to the pancreatic enzymes; the substance responsible is not choline or lecithin, but a sp. substance of the pancreas. R. N. C.

Substance in pancreas (fat-metabolising hormone) which permits survival and prevents liver changes in depancreatized dogs. L. R. DRAGSTEDT, J. VAN PROHASKA, and H. P. HARMS (Amer. J. Physiol., 1936, 117, 175—181).—EtOH extracts of ox pancreas contain a sp. substance that prevents fatty degeneration and infiltration of the livers of depancreatized-insulinised dogs when given orally. The name *lipocaic* is suggested for the active substance, which is sol. in H_2O and 5% NaCl, but insol. in Et_2O , which can be used to free it from fat. R. N. C.

Growth hormone and creatinuria. I. I. NITZESCU and I. GONTZEA (Compt. rend. Soc. Biol.,

1937, 125, 291—293).—Creatinuria occurring before puberty is attributed to the presence of the growth hormone.
H. G. R.

Thymus and pineal glands. L. G. ROWNTREE, J. H. CLARK, A. STEINBERG, A. M. HANSON, N. H. EINHORN, and W. A. SHANNON (Ann. Intern. Med., 1935, 9, 359—375).—Thymus extract increased the growth rate and development and hastened the onset of adolescence in the offspring of treated rats. Thymusctomy of parent rats retarded the growth of the young. Pineal extract retarded growth and accelerated the onset of adolescence.

CH. ABS. (p)

Vitamins in ophthalmology. E. BARONI (Österr. Chem.-Ztg., 1937, 40, 249—252).—A review.

E. S. H.

Technology of vitamins. A. A. SCHMIDT (Bull. Acad. Sci. U.R.S.S., 1936, 929—933).—A lecture.

R. T.

Position of the vitamins in the series of food constituents. L. K. WOLFF (Chem. Weekblad., 1937, 34, 314—317).—A review of the chemical constituents and the physiological actions of vitamin-A, -B₁, -B₂, -C, -D, -D₂, -D₃, -E, and -P.
S. C.

Structure of vitamin-A, -B₁, and -B₂. K. G. PACKENDORF (Bull. Acad. Sci. U.R.S.S., 1936, 901—909).—A review.
R. T.

Production of aqueous solutions of fat-soluble vitamins. G. LORENZINI (Arch. Ist. Biochim. Ital., 1937, 9, 3—18).—The conc. vitamin-A or -D prep. is dissolved in an EtOH solution of bile acids, aq. Na salt of a bile acid is added, and the mixture diluted with H₂O to give a clear, stable solution. Such preps. cannot be assayed by the SbCl₅ method.

F. O. H.

Changes in the vaginal epithelium of the rat on an excessive vitamin-A diet. T. C. SHERWOOD, M. A. BREND, and E. A. ROPER (J. Nutrition, 1936, 11, 593—597).—Administration of large amounts of carotene to rats prevented a normal vaginal smear picture and produced a rapid growth of the epithelium.
A. G. P.

Lesions of the nervous system in vitamin deficiency. IV. Effect of carotene in the treatment of nervous disorder in rats fed a diet low in vitamin-A. H. M. ZIMMERMAN and G. K. COWGILL (J. Nutrition, 1936, 11, 411—423).—Carotene (I) when administered early but not when late in the course of vitamin-A deficiency corrects all but the neurologic disorders associated therewith. Substitution of (I) for -A throughout the experimental period caused no deficiency symptoms. Nervous derangement of rats receiving an -A-deficient diet is due to lack of -A and not to that of unsaturated fatty acids.
A. G. P.

Carotene and associated pigments in medullated nerve. J. P. BARTZ and F. O. SCHMITT (Amer. J. Physiol., 1936, 117, 280—284).—Carotene (I) and vitamin-A in the peripheral nerves of frogs fall during fasting, disappearing completely in 3 or 4 weeks according to the temp. Daily feeding of (I) induces storage in the nerves within a week, considerable

conversion to -A taking place if xanthophyll is also supplied.
R. N. C.

Determination of vitamin-A. W. J. NIJVELD (Chem. Weekblad, 1937, 34, 379—384).—Various methods are examined. The most trustworthy is the Carr-Price method provided that the colour is measured spectrophotometrically. The Rosenthal method (A., 1935, 792) does not give satisfactory results.
S. C.

Synthesis of vitamin-A.—See A., II, 288.

Synergism of vitamins. I. Influence of varying intake of vitamin-A on vitamin-B₁ requirements. A. SCHEUNERT and S. RAU (Z. physiol. Chem., 1937, 246, 267—271).—The administration of large doses of vitamin-A (with some -D) does not affect the -B₁ requirements of growing rats.
F. O. H.

Comparison of methods for extraction of vitamin-B₁ from international standard acid clay. W. L. SAMPSON and J. C. KERESZTESY (Proc. Soc. Exp. Biol. Med., 1937, 36, 30—32).—The quinine sulphate method yields twice the amount obtained by alkali-extraction.
P. G. M.

Vitamins in human nutrition. Vitamin-B₁, and the "brown versus white bread problem." I. L. J. HARRIS. II. P. C. LEONG and L. J. HARRIS (Biochem. J., 1937, 31, 799—811, 812—816).—I. Owing to refection (cf. Roscoe, A., 1932, 200), the vitamin-B₁ contents of white and brown breads cannot be compared by rat growth methods. Using the bradycardia method, it was shown that "germ bread" and wholemeal bread are both 7—8 times as potent as white bread and that "bran bread" is not very inferior to "germ bread."

II. "Germ flour" is similar in activity to wholemeal flour. White flour is an inadequate source of -B₁. -B₁ contents of bran, middlings, and wheat germ are also determined.
E. A. H. R.

Hydrogen sulphite-binding substance in human blood in beriberi. T. SHINDO (Z. physiol. Chem., 1937, 247, III).—The blood of persons suffering from beriberi has a high content of a substance (MeCHO?: isolated as 2:4-dinitrophenylhydrazone) which combines with NaHSO₃. The content is restored to the normal level by administration of aneurin.
W. McC.

In vitro action of crystalline vitamin-B₁ on pyruvic acid metabolism in tissues from polynuritic chicks. W. C. SHERMAN and C. A. ELVEHJEM (Amer. J. Physiol., 1936, 117, 142—150).—The O₂ uptake in presence of pyruvate (I) of brain or kidney tissue from vitamin-B₁-deficient chicks is < normal, whilst their ability to utilise (I) is impaired. Addition of small quantities of -B₁ increases respiration to almost normal vals., the increase being accompanied by an increase in the amount of (I) removed.
R. N. C.

Anaërobic glycolysis in tissues from polynuritic chicks: negative action of vitamin-B₁. W. C. SHERMAN and C. A. ELVEHJEM (Amer. J. Physiol., 1936, 117, 151—154).—Tissues from vitamin-B₁-deficient chicks readily break down glucose

and glycogen to lactic acid under anaërobic conditions. Pyruvic acid does not accumulate. Added $-B_1$ does not affect glycolysis. R. N. C.

Catatorulin effect. H. G. K. WESTENBRINK and J. J. POLAK (Rec. trav. chim., 1937, 56, 315—329).—The O_2 uptake of brain tissue of pigeons in avitaminosis- B_1 , when suspended in Ringer- $PO_4^{'''}$ -pyruvate (I) solution, is increased by adding vitamin- B_1 *in vitro*. The max. effect was obtained when $-B_1$ was added before beginning the respiration experiment, the reaction having an induction period of about 10 min. No such period was observed when (I) was added to a tissue suspension which contained $-B_1$. The view is adopted that the O_2 uptake of avitaminotic brain in presence of (I) is not catalysed by free $-B_1$ but by a compound of B_1 with an unknown labile substance (cf. Gavrilescu and Peters, A., 1932, 200). P. W. C.

Determination of vitamin- B_1 (aneurin). W. KARRER and U. KUBLI (Helv. Chim. Acta, 1937, 20, 369—373).—Jansen's method (A., 1936, 1566) is modified by oxidising the substance or solution containing vitamin- B_1 with alkaline $K_3Fe(CN)_6$, transference of the thiochrome (I) thus produced to Bu^OH , and direct comparison of the intensity of the violet fluorescence excited by ultra-violet light with that given by solutions containing known amounts of $-B_1$ or (I). H. W.

Synthesis of aneurin.—See A., II, 307.

Water-soluble B-vitamins. VII. Growth-promoting properties of lactoflavin. C. E. EDGAR, T. F. MACRAE, and F. VIVANCO. **VIII. Essential dietary factors for the rat present in autoclaved yeast extracts in addition to lactoflavin.** **IX. Properties of the dietary factor in the fuller's earth filtrate from autoclaved yeast extracts.** C. E. EDGAR and T. F. MACRAE (Biochem. J., 1937, 31, 879—885, 886—892, 893—902).—VII. When $-B_1$ is supplemented by no component of the $-B_2$ complex except lactoflavin, young rats maintain low subnormal growth which is increased by a heat-stable factor (I) present in the filtrate from autoclaved yeast extracts treated with fuller's earth or in EtOH extract of wheat germ. The extent of the increase is parallel to the lactoflavin concn. and is not dependent on the source of the supplementary material.

VIII. A second factor in yeast extracts, which is adsorbed on fuller's earth and eluted by 0.1N- $Ba(OH)_2$, is essential for normal growth. $-B_1$ is probably the only B-vitamin destroyed by autoclaving at p_H 5 at 120° .

IX. (I) is stable in dil. $Ba(OH)_2$ and H_2SO_4 at 100° , is unaffected by light, is not adsorbed by fuller's earth or $Al(OH)_3$, but is adsorbed by C, from which it is eluted by aq. NaOH or AcOH. It is pptd. by $Ba(OH)_2$ in 90% EtOH and does not migrate in electrodialysis although it readily passes through a Cellophane membrane. R. M. M. O.

Lactoflavin, a necessary growth-promoting dietary factor. S. ANSBACHER, G. C. SUPPLEE, and R. C. BENDER (J. Nutrition, 1936, 11, 401—409).—Growth of rats is related to the intake of lactoflavin

(I) in the range $2-22 \times 10^{-6}$ g. daily. A biological method of assessing the growth-promoting val. of (I) is discussed. A. G. P.

Concentration of the anti-pellagra factor. C. J. KOEHN, jun., and C. A. ELVEHJEM (J. Biol. Chem., 1937, 118, 693—699).—The residue (400 g.) from the amyl alcohol extract (cf. A., 1935, 669) of liver, extracted with EtOH followed by COMe₂, and purified in aq. solution by adsorption of impurities with C, yields 2.56 g. of solid which protects dogs from black tongue in daily doses of 64 mg. The factor is not adsorbed on colloids. R. M. M. O.

Vitamin- B_2 complex. I. Non-identity of rat dermatitis due to vitamin- B_6 deficiency and the dermatitis of human pellagra. W. J. DANN (J. Nutrition, 1936, 11, 451—462).—Dermatitis in rats on a vitamin- B_6 -deficient diet occurred as extensively in the dark as in light. $-B_6$ is not identical with the pellagra-preventing factor. Lactoflavin probably has no curative action on pellagra. A. G. P.

Pellagra-like syndrome in chicks. S. ANSBACHER, G. C. SUPPLEE, and R. C. BENDER (J. Nutrition, 1936, 11, 529—535).—Heated commercial casein contains a factor which accelerates the rate of growth and diminishes the incidence of the pellagra-like syndrome in chicks. Concentrates prepared from milk and from rice polishings contain a factor which prevents the onset of the syndrome. Vitamin-B and lactoflavin do not contain this factor, which is probably identical with that which prevents dermatitis in rats. A. G. P.

Improved synthetic ration for vitamin- B_4 studies. O. L. KLINE, H. R. BIRD, C. A. ELVEHJEM, and E. B. HART (J. Nutrition, 1936, 11, 515—528).—A revised method is described. The ration previously described (Keenan *et al.*, A., 1934, 226) is modified by purification of the casein, inclusion of highly potent sources of the factors in the vitamin-B complex, except $-B_4$, and by addition of a substance, e.g., dried lung tissue, which prevents lesions of the lining of the gizzard. The improved basal ration causes a nutritional paralysis which is prevented by supplements of peanuts, brain, kidney, or liver tissue. A. G. P.

Chemistry of vitamin-C. Reichstein's synthesis. A. E. FAVORSKI and T. I. TEMNIKOVA (Bull. Acad. Sci. U.R.S.S., 1936, 911—922).—A review. R. T.

Antiscorbutic potency of reversibly oxidised ascorbic acid: enzyme in blood which reduces the reversibly oxidised vitamin. J. R. ROE and G. L. BARNUM (J. Nutrition, 1936, 11, 359—369).—Reversibly oxidised ascorbic acid (I) has approx. 25% of the antiscorbutic potency (guinea-pig) of reduced (I), and is more active when administered orally than when injected subcutaneously. (I) administered in the reversibly oxidised form at the rate of 1 mg. per kg. body-wt. daily is not stored in rat tissue in either the oxidised or reduced form. The antiscorbutic effect of reversibly oxidised (I) is due to a reducing enzyme in blood. A. G. P.

Ascorbic acid and histidase. P. HOLTZ and G. TRIEM (Naturwiss., 1937, 25, 215).—The decomp.

of histidine by ascorbic acid in presence of O_2 is analogous to its enzymic decomp. by histidase.

E. A. H. R.

Relation of the adrenal cortex to vitamin-C. J. E. LOCKWOOD, D. R. SWAN, and F. A. HARTMAN (Amer. J. Physiol., 1936, **117**, 553—558).—A cortical extract relatively free from vitamin-C is prepared by extracting ox cortex with EtOH, passing successively through Et_2O , 70% EtOH, and Et_2O , and filtration through Crystallite. The prep. affords protection against scurvy to a limited degree, large quantities failing to give complete protection. The active substance is therefore not -C, but a constituent of the cortex.

R. N. C.

Formation of vitamin-C in rats with various nutritional deficiencies. A. SCHEUNERT and M. SCHIEBLICH (Z. physiol. Chem., 1937, **246**, 272—277).—The synthesis of vitamin-C in the rat's organism is not influenced by the presence or absence of -A, -B, and/or -D, carbohydrates, or fats in the diet.

F. O. H.

Determination of vitamin-C in the living organism. H. ROTTER (Nature, 1937, **139**, 717).

L. S. T.

Vitamin-C content of human milk and its variation with the diet. I. SELLEG and C. G. KING (J. Nutrition, 1936, **11**, 599—606).—The vitamin-C content of the milk ranged from 0.012 to 0.108, averaging on adequate diets 0.06—0.08 mg. per c.c. Deficiencies were corr. by feeding orange juice. Other data favour the view that man and guinea-pigs can synthesise adequate quantities of ascorbic acid during gestation or infancy.

A. G. P.

Effects of breed characteristics and stages of lactation on the vitamin-C content of cow's milk. R. RASMUSSEN, N. B. GUERRANT, A. O. SHAW, R. C. WELCH, and S. I. BECHDEL (J. Nutrition, 1936, **11**, 425—432).—Differences in ascorbic acid contents of milk from individual cows of the same breed and receiving the same ration were wide and were partly due to differences in the stage of lactation. The latter is a more important factor than breed in this respect. The -C potency is high in the early and late stages of lactation and min. after approx. 2 months.

A. G. P.

Spectrophotometric determination of ascorbic acid in tissues. A. CHEVALLIER and Y. CHORON (Bull. Soc. Chim. biol., 1937, **19**, 511—526).—Both the spontaneous oxidation of ascorbic acid (I) and its transformation on irradiation with ultra-violet light are reversible, the absorption max. at 2650 Å., which almost completely disappears in these reactions, being restored on reduction with H_2S . The spontaneous oxidation of (I), but not its photochemical destruction, is inhibited by 0.002% of KCN. The latter process is more rapid when (I) is in EtOH solution. Based on these observations a method is given for the determination of (I) in tissues. The tissue is ground with Na_2SO_4 in the presence of EtOH saturated with H_2S and containing KCN. An aliquot part of the filtrate is evaporated under N_2 and taken up in 0.002% aq. KCN. The (I) content of this solution is calc. from the difference between its initial absorption curve and that after irradiation

with ultra-violet light. The method is applied to adrenal gland (dog), brain (guinea-pig), and liver (rat, guinea-pig) with an accuracy of 5%. 0.01 mg. of (I) can be determined in this way.

E. A. H. R.

Vitamin-C in the brain and liver of the guinea-pig. A. CHEVALLIER and Y. CHORON (Compt. rend. Soc. Biol., 1937, **125**, 65—66).—These organs contain 3.3—15.5 and 6—10 $\times 10^{-3}\%$, respectively.

H. G. R.

Ascorbic acid in gastric juice. G. A. PETERS and H. E. MARTIN (Proc. Soc. Exp. Biol. Med., 1937, **36**, 76—78).—The ascorbic acid contents of human and canine gastric juices are 0.046—1.04 and 0.33—1.51 mg. per 100 c.c., respectively; those of the duodenum, ileum, colon, fundus, and pylorus decrease in the order named.

P. G. M.

Determination of ascorbic acid (vitamin-C) in blood and urine. V. A. DEVJATNIN and V. M. JOSIKOVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 85—88).—Blood or urine (4 c.c.) with 0.5% aq. $Ca(OAc)_2$ (8 c.c.) and 25% aq. $Hg(OAc)_2$ (4 c.c.) affords a clear centrifugate which is treated with and then freed from H_2S , and titrated with dichlorophenol-indophenol (I). Ascorbic acid (II) is recovered to the extent of 100%. Many reducing substances (including those present in blood) do not reduce (I). Blood contains 0.5—0.6 mg. of (II) per 100 c.c.

J. L. D.

Errors in the determination of vitamin-C in urine after arsenobenzene therapy. I. DAINOW and L. JANOU (Compt. rend. Soc. Biol., 1937, **125**, 244—246).—The reducing power of the urine is augmented after injection of arsenobenzene.

H. G. R.

Post-mortem changes in the ascorbic acid content of the adrenals. G. MOURIQUAND and P. VIENNOIS (Compt. rend. Soc. Biol., 1937, **125**, 289—290).—Reductions of 25, 38, and 58% in 24, 48, and 76 hr., respectively, after death were observed in guinea-pigs.

H. G. R.

Determination of total vitamin-C in foodstuffs. P. N. SEN-GUPTA and B. C. GUHA (J. Indian Chem. Soc., 1937, **14**, 95—102).—In determining the amount of ascorbic acid (I) by titration with 2:6-dichlorophenol-indophenol by the following methods: (a) $CCl_3 \cdot CO_2H$, (b) $\dot{C}Cl_3 \cdot CO_2H$ and HCl, (c) heating in CO_2 or N_2 for different periods, (d) cold H_2S , (e) hot H_2S , (e) gives the highest val. and appears to record the free vitamin, (I) released by heating, and reversibly oxidised (I).

F. R. S.

Combined ascorbic acid in plant tissues. B. C. GUHA and J. C. PAL (Nature, 1937, **139**, 843—844; cf. this vol., 78).—EtOH and Et_2O extracts of cabbage when heated in N_2 give higher ascorbic acid (I) vals. even when titrations are carried out after addition of CH_2O or after treatment with $Hg(OAc)_2$. Further evidence of the presence of combined (I) is provided by the higher vals. given by treatment of hot suspensions and extracts of cabbage with H_2S compared with those obtained at room temp. $CHCl_3$ extracts of dried cabbage give a titre with the indophenol reagent only after heating in an aq. suspension, and most of this reduction val. disappears

when the heated extract is subjected to the action of a prep. of (I) oxidase. L. S. T.

Vitamin-C in vegetables. VI. Determination of ascorbic acid by Tillmans' method. G. L. MACK and D. K. TRESSLER (J. Biol. Chem., 1937, 118, 735—742).—The enzymic oxidation of ascorbic acid during determination by Tillmans' method is inhibited by the presence of 15% aq. H_2SO_4 + 2% HPO_3 . Reduction with H_2S is thus rendered unnecessary, but when H_2S is used the reduction of substances other than dehydroascorbic acid is thus prevented. W. McC.

Excretion test for vitamin-C deficiency. E. P. RALLI, G. J. FRIEDMAN, and M. KASLOW (Proc. Soc. Exp. Biol. Med., 1937, 36, 52—54).—In normal subjects after intravenous injection of 100 mg. of ascorbic acid 40% is excreted in 3 hr., as compared with 11% in subnutrition and 2.6% in cases of scurvy. P. G. M.

Effect of inorganic acids on catalytic oxidation of ascorbic acid.—See A., I, 368.

Vitamin-C [and scorbanic acid].—See A., II, 274.

Antiscorbutic properties of methyl 2-ketogluconate. V. M. RODIONOV (Bull. Acad. Sci. U.R.S.S., 1936, 923—927).—Me 2-ketogluconate (< 0.05 g. per day) protects guinea-pigs against scurvy. R. T.

Vitamin-D developments. F. B. MCKENZIE (Proc. Ann. 8th State Coll. Washington Inst. Dairying, 1935, 22—25).—Practical means of increasing -D in milk are discussed. CH. ABS. (p)

Plant origin of a vitamin-D. H. H. DARBY and H. T. CLARKE (Science, 1937, 85, 318—319).—The lipin fractions of *Sargassum*, but not those of *Ulva* and *Laminaria*, have antirachitic properties. The unsaponifiable fraction of the oils from *Sargassum* yielded a cryst. sterol identical with the fucosterol isolated from *Fucus vesiculosus*, but showing no selective absorption in the ultra-violet. Non-cryst. fractions of the oil show an absorption band at 260 $m\mu$ superimposed on the absorption of carotenoids etc. The occurrence in plants of a vitamin-D must therefore be recognised. L. S. T.

Effect of vitamin-E deficiency on the thyroid. (MISS) M. M. O. BARRIE (Nature, 1937, 139, 286).—The young of vitamin-E-deficient female rats show symptoms of cretinism. L. S. T.

Dietary factors concerned in nutritional muscular dystrophy. S. MORGULIS and H. C. SPENCER (J. Nutrition, 1936, 11, 573—591).—At least two factors are concerned in the prevention and cure of muscular dystrophy. Both occur in fresh green lucerne and in whole wheat germ. One factor is present in cold-pressed wheat-germ oil, and the other in lettuce and in dry lucerne. One factor is destroyed by $FeCl_3$ in Et_2O , by drying, or by extraction with H_2O or $EtOH$. A. G. P.

Permeability of the vegetable cell to mineral salts. M. V. HOMÈS (Arch. Biol., 1936, 47, 399—498).—Methods of determining permeability are critically reviewed. Analysis of the surrounding salt solu-

tion shows that, in turnip roots, Cl' can penetrate into the cell from solutions of concn. < that of the cell sap. Penetration is the greater the lower is the concn. of the surrounding medium; it varies with the cations present in the solution and increases in the order NH_4^+ , Li^+ , Mg^{++} , Ca^{++} , Na^+ , K^+ . M. A. B.

Physical analysis of the plasmolytic fragmentation of elongated protoplasts. H. PFEIFFER (Protoplasma, 1936, 25, 528—545). M. A. B.

Band plasmolysis of the endodermis cells of *Cobaea scandens*. L. SCHNEE (Protoplasma, 1936, 26, 97—99).—Plasmolysis in conc. aq. sugar or $NaCl$ or in 70% $EtOH$ causes the plasma of the starchy endodermis cells to contract into thin plates which remain attached to the sides of the cells at certain points, where the plasma probably penetrates the cell wall. M. A. B.

Vacuole contraction and anthocyanophores in *Pulmonaria* petals. F. WEBER (Protoplasma, 1936, 26, 100—107).—In *P. rubra* and *P. officinalis* a change of red pigment to blue accompanies vacuole contraction; the cell sap probably becomes alkaline through increased permeability of the tonoplast. Many of the epidermic cells contain dark red anthocyanophores of gel nature, surrounded by the cell sap also pigmented with anthocyanin red. These anthocyanophores probably arise from a primary (physiological) vacuole contraction. A secondary (pathological) vacuole contraction can also occur, whereby the colour changes to blue. The red anthocyanophores bleach with rise in temp. M. A. B.

Effect of micrurgical treatment on the resting nucleus of plant cells. I. Puncturing experiments. II. Injection experiments. T. PÉTERFI and H. KOJIMA (Protoplasma, 1936, 25, 489—500, 501—514).—I. A visible structure is produced in the structureless nuclear contents of the cells of *Tradescantia* anthers by disturbing or puncturing the nucleus. The phenomenon is probably not thixotropic but is a coacervation of the complex sol due to increased penetration of electrolytes into the nucleus.

II. Injection of H_2O , hypertonic $NaCl$ solution, 0.001N-AcOH, and 0.001N-KOH into the cytoplasm of *Tradescantia* anther cells caused the formation of a visible structure in the nuclear substance similar to that produced by mechanical disturbance of the nucleus, thus confirming the theory that the changes are due to increased penetration of electrolytes from the cytoplasm through the nuclear membrane. M. A. B.

Death resulting from freezing vegetable cells in liquid nitrogen at -190° . P. BECQUEREL (Compt. rend., 1937, 204, 1267—1269).—Epidermal cells and nuclei of the scales of the bulbs of *Allium cepa* shrink, when immersed for 10 min. in liquid N_2 , as a result not of plasmolysis but of syneresis. J. L. D.

Physico-chemical studies of the sap of vines. E. BELTRAN, P. ALDEBERT, and A. GRASSET (Compt. rend. Acad. Agric. France, 1936, 22, 52—54).—Neutralisation curves for each sap are obtained and from them the buffer-coeff. curves. If these show many marked summits, they are highly buffered.

Vines with such saps are resistant to accidental changes of p_H in the soil. A. W. M.

Morphogenic action of an aqueous medium on plants. M. T. GERTRUDE (Compt. rend., 1937, 204, 1132—1134; cf. this vol., 80).—In *Veronica anagallis*, tissue grown under submerged conditions contained less total sugars, and during the whole period of growth less reducing sugars, less holoside hydrolysable by invertase, and less heteroside hydrolysable by emulsin than tissue produced in air. In submerged plants assimilation is probably checked at the stage at which complex N and P compounds are produced. A. G. P.

Relation between rate of transpiration and rate of absorption of water in plants. P. J. KRAMER (Amer. J. Bot., 1937, 24, 10—15).—In green ash, yellow poplar, loblolly pine, and sunflower plants day transpiration was > and night transpiration < the corresponding vals. for H_2O absorption. Plants grown in H_2O cultures behaved similarly to those in soil. Changes in transpiration precede and largely control those in absorption. A. G. P.

Variations in leaves of cotton plants grown under irrigation in the Sudan Gezira. G. B. PORTSMOUTH (Ann. Bot., 1937, [ii], 1, 277—291).—Successively developing cotton leaves may begin their growth with different constitution and subsequent changes may be dissimilar. The basic H_2O content of leaves on the same stem decreases steadily up to approx. the 15th node. Similar variations occur in the % of N, except that leaves produced in the second growth period show a slightly higher level of N as a result of the resumption of N intake following the maturation of the first crop of bolls. In individual leaves the total N increased with growth to a max. which was reached when the expansion of the lamina was complete. Subsequently the vals. diminished. Diurnal changes in H_2O content, together with the effects of irrigation, are examined. A. G. P.

Influence of soil moisture and fertilisers on the specific conductivity of tomato plant sap. A. C. FOSTER and E. C. TATMAN (Amer. J. Bot., 1937, 24, 35—39).—A close correlation is established between fertiliser applications and H_2O content of soil, the amount of H_2O used daily by plants, and the ultimate H_2O requirement of the plants. Among plants grown at different soil- H_2O contents, there is a positive correlation between the soil- H_2O content and the electrical resistance of the plant sap. Increasing supplies of soil- NO_3^- or K_2SO_4 are associated with increasing electrolyte contents of the sap as shown by decreased electrical resistance. The latter was influenced more by soil- H_2O content than by fertiliser treatment. A. G. P.

Donnan membrane equilibrium in the absorption of nutrients by plants. Intake of nitrogen, phosphate, potassium, calcium, and magnesium by maize varieties.—See B., 1937, 598.

Nitrogen nutrition and chemical composition in relation to growth and fruiting of the cucumber plant.—See B., 1937, 599.

Characteristics of the growth and mineral nutrition of hemp with simultaneously maturing male and female plants. L. G. DOBRUNOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 521—524).—The increased productiveness of the new variety of hemp in which plants of both sexes mature simultaneously is partly accounted for by the greater growth, and better nutrition of the male plants. The root system of the new variety is more extensive and the mineral intake from the soil is accordingly greater. W. O. K.

Evolution of the different forms of phosphorus [compounds] during forcing of the lily-of-the-valley. R. QUETEL (Compt. rend., 1937, 204, 885—887).—In Et_2O -forced as in control plants, the amounts of lipin- (I), residual (II), and insol. P (III) rise rapidly during budding and flowering. At flowering, (I) and (III) in control plants are > in forced, but (II) has in forced plants nine times, in control plants five times, its initial val. The results are compared with similar data for N (A., 1936, 1165).

F. A. A.
Excretion from leguminous root nodules. G. BOND (Nature, 1937, 139, 675—676).—Analysis of the sand rooting medium in which soya-bean plants had been grown showed no evidence of excretion of fixed N at any stage in development, although extensive fixation occurred within the nodules (cf. this vol., 48). L. S. T.

Preparation and identification of nucleic acids occurring in plant-cell nuclei. R. FEULGEN, M. BEHRENS, and S. MAHDIHASSAN (Z. physiol. Chem., 1937, 246, 203—211).—Rye embryos, on milling, flocculation from C_6H_6 and from $C_6H_6-CCl_4$ (1:2 vols.), pptn. by Na_2CO_3 , digestion with pancreatin [which contains nucleogelase and transforms *a*- into *b*-thymonucleic acid (I)], pptn. by $EtOH$ etc., yield (I), identified by hydrolysis and isolation of guanine, adenine, cytosine, and thymine.

F. O. H.
Nitrogen metabolism during germination of the lupin (*Lupinus albus*, L.). R. ÉCHEVIN and A. BRUNEL (Compt. rend., 1937, 204, 881—883).—The total N of lupin seeds before germination contains 86% of protein-N. During germination this val. drops markedly, and 83% of the total N appears in the form of sol. compounds, mainly arginine, but also purine derivatives, including uric acid, allantoin, and allantoic acid. Urea is absent both before and after germination. Uricase appears during germination, and allantoinase is increased ten-fold; allantoicase is not detectable either before or after germination. F. A. A.

Existence of an azoligase. W. SKALLAU (Zentr. Bakt. Par., 1936, II, 93, 244—247).—No evidence of an increasing N content of germinating legume seeds was obtained. A. G. P.

Effect of ascorbic acid and certain indole derivatives on regeneration and germination of plants. W. DAVIES, G. A. ATKINS, and P. C. B. HUDSON (Ann. Bot., 1937, [ii], 1, 329—351).—Epinastic response of tomato plants was obtained by stem treatments with hetero-auxin or β -indolylpropionic

acid but not with ascorbic acid or other indole derivatives examined (see also A., 1936, 909).

A. G. P.

Oxygen evolved by isolated chloroplasts. R. HILL (Nature, 1937, 139, 881—882).—Fresh suspensions of chloroplasts obtained from various angiosperms with sucrose solutions do not evolve measurable quantities of O_2 in light even in presence of CO_2 . When suspended in an aq. extract made from a $COMe_2$ -leaf prep., however, measurable amounts of O_2 are evolved on illumination. The activity of these preps. depends on their content of Fe^{+++} , which is reduced to Fe^{++} , and is the only reagent at present known to cause O_2 evolution by free chloroplasts.

L. S. T.

Carbon dioxide exchange rhythm and fruitfulness in plants of different reproductive habits. R. H. ROBERTS, J. E. KRAUS, and N. LIVINGSTON (J. Agric. Res., 1937, 54, 319—343).—Photoperiodicity may not be due to photosynthetic activity. The form of CO_2 -exchange curves is influenced by stomatal movements but is not greatly altered by artificial illumination beyond the normal day period. The curves become irregular during the reproductive stage.

A. G. P.

Response of the respiratory system in mango and guava to alterations in the concentration of oxygen and nitrogen. B. N. SINGH, P. V. V. SESHAGIRI, and S. S. GUPTA (Ann. Bot., 1937, [ii], 1, 311—323).—The CO_2 output of mangoes and guavas increases on transference from cold storage (8°) to 30° , probably because of the change in solubility of CO_2 in the H_2O present in the intercellular spaces. It is also increased by transferring the fruit from air to an atm. of N_2 . The rate of CO_2 production on transference from N_2 back to air is directly related to the period of anaërobiosis. The min. CO_2 output occurs in 9.2% of O_2 in which condition the R.Q. (0.85) suggests that fats and carbohydrates may form the substrate for respiration.

A. G. P.

Respiration of bananas.—See B., 1937, 614.

Photosynthesis and the absorption of radiation by plants. G. R. BURNS (J. Amer. Chem. Soc., 1937, 59, 944—945).—The amount of photosynthesis in white-pine seedlings depends on the "primary absorption spectrum," which is determined from the reflexion of the needles to light of 45° incidence and the absorption of light by the plant pigments in $COMe_2$ solution of the same concn. as in the plant. No explanation of agreement with this arbitrary val. is offered.

E. S. H.

Efficiency of utilisation of sunlight in growth of green plants under natural conditions. W. NODDACK and J. KOMOR (Angew. Chem., 1937, 50, 271—277).—A lecture. Over a prolonged period the efficiency is approx. 0.6%, in agreement with results obtained with single cells.

J. S. A.

Influence of water deficiency on photosynthesis and transpiration in apple leaves. A. J. HEINICKE and N. F. CHILDERS (Proc. Amer. Soc. Hort. Sci., 1935, 33, 155—159).—Gradual drying of soil causes a reduction in the rates of photosynthesis and transpiration. The latter is the first to be

affected. Stomatal closing with lowered H_2O supply conserves H_2O to a greater extent than it diminishes photosynthesis.

A. G. P.

Time course of photosynthesis for a higher plant. E. D. McALISTER (Smithsonian Misc. Coll., 1937, 95, No. 24, 17 pp.).—A spectrographic (infrared) method of determining CO_2 is described. The induction period in the photosynthetic activity of young wheat leaves varied with temp. and with the intensity of illumination in a manner similar to that in algae. Induction is associated with loss of CO_2 in so far as photosynthesis is concerned. This loss increases with increasing light intensity. With intermittent (equal) periods of light and darkness induction is small at high frequencies (0.17 sec.) and $>$ normal at 5—15 sec. With periods between 15 sec. and full daylight, CO_2 assimilation falls to a min. at 1—5 min. and increases with extension of the periodicity. Respiration recommences immediately the illumination is cut off at the same rate as before the exposure. Experimental data support the views of Francke and of Kautsky on the luminescence of chlorophyll.

A. G. P.

Effects of light and of oxygen on the uptake of sugar by the foliage leaf. E. PHILLIS and T. G. MASON (Ann. Bot., 1937, [ii], 1, 231—238).—Formation of starch in previously de-starched cotton leaves when placed in sugar solutions is accelerated independently by O_2 and by light. The action results from accelerated absorption of sugar by the leaf rather than from any disturbance of the sugar-starch equilibrium. Light probably increases the permeability of plasma membranes whereas O_2 affects the solvent capacity of the cytoplasm.

A. G. P.

Growth substances in *Elodea canadensis*. M. HOMES and G. VAN SCHOOR (Bull. Acad. roy. Belg., 1937, [v], 23, 183—193).—Increase of the internodal distance is inhibited when the growing point is removed. Replacement of the point on the cut stem induces growth even if a thin plate of agar is interposed between the cut surfaces. Growth-promoting substances probably diffuse back from the point. Aq. extracts of the growing point cause the decapitated shoots to grow and induce preferential growth on the treated side of shoots.

J. L. D.

Yeast growth-substance in buds and leaves. J. DAGYS (Protoplasma, 1936, 26, 20—44).—The yeast growth-substance present in buds and cambium of oak and willow and in pine needles is thermostable, readily sol. in 90% MeOH and abs. EtOH, fairly sol. in abs. $COMe_2$, slightly sol. in $CHCl_3$ and Et_2O , insol. in light petroleum and C_6H_6 . It is adsorbed by animal C but not by kaolin, not pptd. by $Pb(OAc)_2$, is unaffected by autoclaving with HCl, but is partly inactivated by autoclaving with NaOH and also by oxidation with H_2O_2 or HNO_3 .

M. A. B.

Production and distribution of growth hormone in shoots of *Aesculus* and *Malus* and its probable rôle in stimulating cambial activity. G. S. AVERY, jun., P. R. BURKHOLDER, and H. B. CREIGHTON (Amer. J. Bot., 1937, 24, 51—58).—Dormant winter buds of *A. hippocastanum* gave a negative *Avena* test. Growth hormone (I) appears

in *Aesculus* and *M. malus* as the buds swell and max. amounts coincide with the period of rapid extension of current-season shoots. Later the proportion declines with the rate of growth. Throughout the season concns. of (I) in fruit-bearing are $>$ in leaf-bearing shoots. In stems the (I) content decreases from the terminal portions downward; it is produced largely in the terminal region and is translocated basipetally into the older parts of the stem. This movement is paralleled by initiation of cambial activity. A. G. P.

Rôle of auxin in leaf development in *Solidago* species. R. H. GOODWIN (Amer. J. Bot., 1937, 24, 43—51).—Differences in the rate of development of basal rosette leaves of *S. sempervirens*, *S. rugosa*, and of the hybrid, and the effects of the removal of these leaves on the development of the younger leaves, are paralleled by variations in the amount of auxin present. Diffusion of auxin from cut leaf stems is small in the early stages of growth, increases to a max. at the period of most rapid development, and subsequently declines towards maturity. The amount of auxin per unit wt. of fresh leaf tends to be inversely related to the wt. of the leaf. A. G. P.

Distribution of substances acting as vegetable auxins in *Discoglossus pictus*, Oth. H. BERRIER (Compt. rend. Soc. Biol., 1937, 124, 1319—1321).—These substances are distributed generally through the adult organism but are most abundant in tissues connected with excretory functions. H. G. R.

Determination of auxin-B. L. REUTER (Protoplasma, 1936, 25, 614—628).—The method is based on measurement of the increase in size of yeast cells using a hæmatocrit or similar apparatus. M. A. B.

Inactivation of the auxins. H. ERXLEBEN (Chem. Weekblad, 1937, 34, 317—318).—Inactive auxin-a (I) contains two stereoisomerides, *pseudoauxin-a*₁ and -a₂, the δ -OH being displaced to the ζ position and the double linking to the $\delta\epsilon$ position. Oxidation of (I) with O₃ gives the corresponding *acyloin*. In *pseudoauxin-b* the CO is situated in the β -, the double linking in the $\delta\epsilon$ -, and the OH in the ζ -position. Auxin-a lactone also becomes inactive on keeping or very rapidly by irradiation with ultra-violet light, forming *lumiauxin-a lactone*, C₁₈H₂₈O₃, containing OH and $\cdot\text{C}:\text{C}\cdot$ groups, by loss of H₂O at the $\beta\gamma$ -linking, and showing a strong absorption band at 295 m μ . Oxidation with O₃ affords a cyclic ketone, C₁₃H₂₄O. S. C.

Effects of the length of X-ray waves on seeds. A. A. BLESS (Proc. Nat. Acad. Sci., 1937, 23, 194—196).—X-Irradiation of the seeds of yellow dent maize increases the growth of the plant after germination. The effect is independent of λ between 0.6 and 1.2 Å., but the optimum dose depends on the time after germination at which observations are made. W. O. K.

Why do leaves appear bright in infra-red light? R. MECKE and W. C. G. BALDWIN (Naturwiss., 1937, 25, 305—307).—EtOH solutions of chlorophyll, xanthophyll, and other plant pigments and different kinds of leaves lose their characteristic

optical properties so far as these are not conditioned by structural differences as soon as the crit. λ 700—750 m μ is exceeded. Leaves viewed in infra-red light appear therefore colourless and bright and possess a high power of reflexion of light rays. P. W. C.

Physiological activity of rust-infected cereal leaves. G. GASSNER and G. GOEZE (Phytopath. Z., 1936, 9, 371—386).—Inoculation of susceptible varieties of wheat with rust diminishes the chlorophyll content and rate of CO₂ assimilation and increases transpiration. A. G. P.

Micro-biological decomposition of wood. I. F. KOMAROV and G. FILIMONOVA (J. Appl. Chem. pine or birch attacked by *Merulius lacrymans*, Poly-Russ., 1937, 10, 487—496).—The OMe content of *porus destructor*, or *Fomes igniarius* is $<$ that in unattacked wood, to an extent varying with its lignin content and with the type of mould. The Ac and uronic acid contents are not affected. The content of H₂O- and 1% NaOH-sol. substances (tannins, reducing sugars, and salts) rises, and the pentosan content falls, in all cases, whilst the contents of EtOH-C₆H₆-sol. substances, cellulose, and lignin are $>$ or $<$ the initial vals., depending on the nature of the mould and its substrate. R. T.

Effect of certain enzymes and amino-acids on crown gall tissues. P. A. ARK (Science, 1937, 85, 364).—The injection of a mixture of *Erwinia carotovora* into crown galls on geranium, young tomato, and sunflower quickly destroys the galls. Pepsin, papain, diastase, cysteine hydrochloride, leucine and isoleucine, but not tryptophan and tyrosine, act similarly. L. S. T.

Frenching of tobacco and thallium toxicity. E. L. SPENCER (Amer. J. Bot., 1937, 24, 16—24).—Of 33 toxic elements examined only Tl caused chlorosis in the youngest leaves and the production of strap-shaped leaves in tobacco. The induced chlorosis was controlled by application of Ca(NO₃)₂, KI, or Al₂(SO₄)₃. These treatments also prevent frenching. The natural occurrence of frenching may be due to toxic concns. of Tl in soil. A. G. P.

Vital staining of plant cells with neutral-red. S. STRUGGER (Protoplasma, 1936, 26, 56—69).—The distribution of the neutral-red (I) in plant cells depends on the p_H of the medium. Below p_H 7.1 the cell membrane, above p_H 7.1 the vacuole, is stained. If cells stained in alkaline solution are placed in acid solution, in liquid paraffin, under conditions of O₂ deficiency, or plasmolysed in glucose solution, (I) is transferred from the vacuole to the cell membrane. The reverse process is effected by treating cells stained in acidified distilled H₂O with tap-H₂O or alkaline solution. M. A. B.

Theory and technique of nuclear staining. P. F. MILOVIDOV (Protoplasma, 1936, 25, 570—597).—Many plant cell nuclei formerly believed to give negative staining reactions can be stained by using a suitable technique. Faint or negative staining is very frequent in cells containing much tannin and addition of tannin to other cells inhibits the normal staining. In many cases a negative reaction may be due to

such inhibition by substances, probably tannins, occurring in the cell. M. A. B.

Nitrogen partition in three native varieties of pigeon peas (*Cajanus cajan* [L.], Millsp.). A. M. LOCSIN (Philippine Agric., 1935, 24, 481—487).—Analyses show H₂O 10.2—15.6, fat 8.2—29.7, ash 4.2—4.9, fibre 8.3—9.2, total N 3.1—3.6%. The N partition is: amide 9.7—10.9, humin 1.3—1.5, arginine 14.6—17.1, histidine 3.3—6.5, lysine 10.5—12.2, NH₂ 51.15, other N 0.15—0.98%. CH. ABS. (p)

Sulphur content of some Indian grasses. F. J. WARTH and T. S. KRISHNAN (Indian J. Vet. Sci., 1937, 7, 54—58).—With grasses growing side by side, species of Chlorideæ contained more SO₄ than other species (0.27% against 0.06% of dry matter). No extra S occurred in the protein. Grass stalks contained more SO₄ than the leaf but migration of SO₄ to the leaf occurred on drying. W. L. D.

Comparative elementary composition of floral structures. C. SOSA-BOURDOUIL (Compt. rend., 1937, 204, 997—999).—The pollen grains of *Acanthus* contain a higher % of C, H, and N than the remainder of the flower. The andræcium and gynæcium are similar in composition before maturity but when pollen differentiates, the composition of the andræcium, but not that of the gynæcium, changes even after fertilisation. In *Ranunculus asiaticus*, L., the semi-petaloid stamens have a composition intermediate between that of the true stamens and of petals. The pollen of a variety of plants has C 50.3—53.4, H 7—7.5, and N 5.8—6.9 whereas the ovules have C 45.0—46.7, H 5.9—6.5, and N 4.0—5.7%. J. L. D.

Carbohydrates in extracts of flowers of *Opuntia Ficus-Indica*. G. SANFILIPPO and A. CANNAVA (Boll. Soc. ital. Biol. sperim., 1937, 12, 73—74).—Aq. extracts contain free maltose (and possibly glucose) and a mannogalactan. F. O. H.

Chemical examination of *Clerodendron infortunatum*. I. H. N. BANERJEE (J. Indian Chem. Soc., 1937, 14, 51—57).—The dried leaves of this verbenaceous shrub (the Indian "bhant" or "bhat," used as vermifuge) give, on extraction by light petroleum, the bitter substance *clerodin* (I), m.p. 161—162°, with a sterol, m.p. 147—148° (Ac derivative, m.p. 127—128°), an alcohol, m.p. 75°, linolenic and oleic acids, etc. The EtOH extract contains gallic acid, a sugar (osazone, m.p. 202—203°), etc. (I) is not hæmolytic, and is non-toxic to the rabbit or to *B. coli*, but is toxic to earthworms, to small fish, and to mosquito larvæ. E. W. W.

Constitution of artostenone, a ketonic sterol from *Artocarpus integrifolia*.—See A., II, 294.

Lucaenol, a principle from the seeds of *Lucaena glauca*, Benth.—See A., II, 296.

Morellin, a constituent of the seeds of *Garcinia morella*.—See A., II, 298.

Quassin and nequassin.—See A., II, 297.

Bark of American larch. K. E. LARSEN and E. V. LYNN (J. Amer. Pharm. Assoc., 1937, 26, 288—290).—Starch, pentosans, tannin, saponin, and resin (10%) but no alkaloids are found. F. O. H.

Constituents of kaoliang. S. HIRAO (J. Agric. Chem. Soc. Japan, 1935, 11, 921—924).—Succinic and other unidentified acids and a yellow glucoside, m.p. 249—250° (probably quercimeritrin), were isolated from hot aq. extracts of kaoliang.

CH. ABS. (p)

Glucoside of *Belamcanda chinensis* (L.) (*Pardanthus chinensis*, Ker), shekanin (tectordin).—See A., II, 276.

Synthesis of lusitanicoside (chavicol-β-rutinoside), the glucoside from *Cerasus lusitanica*, Lois.—See A., II, 277.

Chemistry and pharmacology of *Phytolacca americana*, N.F. S. W. GOLDSTEIN, G. L. JENKINS, and M. R. THOMPSON (J. Amer. Pharm. Assoc., 1937, 26, 306—312).—Analytical data for the root examined by the U.S.P. X method for crude drugs are given. Aq. EtOH extracts yield a terpenecious oil, *d* 0.9977. The root contains hemicellulose, isosaccharic acid, gum, resin, H₂C₂O₄, saponin, and starch, but no reducing sugar or active alkaloid. The pharmacological activity is due to < two principles, one sol. in EtOH and the other in H₂O. F. O. H.

Alkaloids of *Convolvulus pseudocanthabricus*, *Arundo donax*, and *Cytisus caucasicus*.—See A., II, 311.

Alkaloids of *Anabasis aphylla*.—See A., II, 310.

Components of *Cetraria islandica*.—See A., II, 290.

Lignin and resin. B. L. VANZETTI (Atti V Congr. Naz. Chim., 1936, 14, 932—937).—From a consideration of the structure of olivil and isoolivil (A., 1929, 1064) the biogenetic relationship between lignin and resin is discussed. L. A. O'N.

Organic constituents of a recent deposit from Chincoteague Bay, Virginia.—See A., I, 381.

Microscopically heterogeneous mode of reaction of fibres. A. FREY-WYSSLING (Protoplasma, 1936, 26, 45—50).—Under the polarising microscope nitration of cellulose fibres appears to proceed in a homogeneous fashion, whereas acetylation appears to be heterogeneous. This is due to the different swelling action of the various reaction media on the cellulose. If the reaction bath swells the primary layer, as in nitration or denitration in H₂O, the fibre reacts homogeneously; if it shrinks the primary layer, as in acetylation in C₆H₆ or denitration in EtOH, fissures develop in this layer, allowing increased penetration at these points, and the fibre reacts heterogeneously. M. A. B.

Vapour method of changing reagents and of dehydration. C. B. BRIDGES (Stain Tech., 1937, 12, 51—52).—Good preps. are obtained by dehydrating acetocarmine smears with EtOH vapour and applying euparal directly. E. M. W.

Staining cells with Sudan III in a water phase. J. DUFRENOY and H. S. REED (Stain Tech., 1937, 12, 71—72).—Intravacuolar spheres of lipin are stained bright orange by a suspension produced by dissolving Sudan III in methylal and adding the solution to H₂O. E. M. W.

Histological stain from black walnut (*Juglans nigra*, L.). C. R. LIMBER and J. T. GAMBLE (Stain Tech., 1937, 12, 49—50).—A slow nuclear stain is prepared from the black walnut. A mordant is necessary and Fe alum is recommended. E. M. W.

Microchemical detection of cystoliths by Molisch's method. Means of detecting reduction phenomena brought about in cystoliths by ultra-violet light. O. RICHTER (Mikrochem., Molisch Festschr., 1936, 350—365).—By the use of 0.1% AgNO_3 in Molisch's test for CaCO_3 , reduction occurs only where the tissue has been irradiated with light of $\lambda < 3000 \text{ \AA}$. Cystoliths of the leaves of *Urtica dioica*, after storage in the dark, show reduction only in irradiated areas, and CaCO_3 , on substrates of cellulose or starch (filter-paper or potato tissue), shows the same effect. J. S. A.

Significance of microchemistry for limnological investigations. F. RUTTNER (Mikrochem., Molisch Festschr., 1936, 379—386).—A review. J. S. A.

Preservation of [specimens of] the most usual wood reactions. L. LOHWAG (Mikrochem., Molisch Festschr., 1936, 314—318).—Permanent standard specimens may be made of the $\text{NH}_2\text{Ph}\cdot\text{H}_2\text{SO}_4$ reaction, but not of the phloroglucinol or Maule tests. J. S. A.

Technique of measuring peptisation processes in proteolysis. I. P. STEFANOVITSCH (Biochimia, 1936, 1, 699—704).—Collagen is maintained in contact with the peptising agent for 18 hr., and the product is treated with 4% NaOAc (65°; 2.5 hr.). The amount of gelatin going into solution, as compared with untreated collagen, is a measure of peptising activity. R. T.

Application of drop reaction to the ninhydrin test. E. ABDERHALDEN (Mikrochem., Molisch Festschr., 1936, 1—2).—1—2 drops of filtered extract are treated with 1 drop of 2% ninhydrin (I), and evaporated at 100°. For the detection of differences in the concn. of substances giving the (I) reaction, the use of a reagent containing 1 part of 1% (I) + 39 parts of aq. fructose, with thymol as a preservative, is preferable, the solutions being measured out accurately. J. S. A.

Inhibitors of colour development in the Sullivan method for cystine. J. C. ANDREWS and K. C. ANDREWS (J. Biol. Chem., 1937, 118, 555—567).—Ascorbic acid, adrenaline, H_2S , photographic developers, and compounds producing sulphides in alkaline solutions give rise to low results, e.g., in urine. Oxidation of inhibitors by aëration prior to cystine determination is recommended as is the use of alkaline (2N) aq. NaCN . P. G. M.

Determination of barbiturates in blood and urine. J. T. BRUNDAGE and C. M. GRUBER (J. Pharm. Exp. Ther., 1937, 59, 379—392; cf. Koppányi *et al.*, A., 1935, 245).—After acidification, diluted urine or deproteinised blood is shaken with activated C, which is then mixed with CaSO_4 and extracted with Et_2O —light petroleum (b.p. 30—40°) (1:1). The extracted material is treated with $\text{Co}(\text{OAc})_2$ and NH_4Pr^s and the colour produced compared with

that of a standard. The mol. wt. of barbiturates (I) is not directly related to the depth of the colour. Possibly the substance excreted in the urine is a degradation product of (I). Some (I) disappear from the blood very rapidly (<1 min.) after injection. W. McC.

Spectrophotometric studies of colour development in analysis of sugar by the Benedict method and of cholesterol by the Liebermann-Burchard reaction.—See A., II, 313.

Determination of fumaric acid in protein solutions containing succinic acid.—See A., II, 313.

Apparatus for micro-determination of ammonia-nitrogen by distillation and aëration. I. GOLDBERG and R. F. BANFI (Rev. soc. argentina biol., 1935, 11, 440—448).—The alkaline solution is heated under a reflux condenser. A slow air current through the apparatus carries the NH_3 through the condenser to an acid trap. CH. ABS. (p)

Determination of small amounts of arsenic in biological material. K. HINSBERG and M. KIESE (Biochem. Z., 1937, 290, 39—43).—A method is described in which the org. material (organ, secretion, etc.) is ashed in As-free glass with a mixture of HClO_4 , HNO_3 , and H_2SO_4 , the As separated as AsCl_3 in a stream of HCl , converted into AsH_3 , and determined by reduction of AuCl_3 . P. W. C.

Biochemistry of fluorine. II. Determination in blood and [mineral] waters. K. KRAFT and R. MAY (Z. physiol. Chem., 1937, 246, 233—243; cf. this vol., 103).—A micro-method, based on the H_2O -distillation of H_2SiF_6 from the ashed material in 50% H_2SO_4 + powdered glass at 130—140° into 2N- NaOH which is subsequently titrated by the Kolthoff-Stansby method (A., 1934, 500), is described. Data for the F content of normal and diseased (Basedow) blood and of some mineral H_2O are tabulated. F. O. H.

Micro-determination of iodine in biological material. (A) H. DOERING. (B) H. LÖHR and H. WILMANN (Biochem. Z., 1937, 290, 272—274, 275—276; cf. this vol., 82).—(A) Wilmanns underestimates the accuracy attainable by the author's method. The EtOH extract must be absolutely free from org. matter.

(B) A reply.

W. McC.

Use of thorium nitrate for rapid ashing of serum and urine. I. For subsequent potassium determinations. M. B. STRAUSS (J. Biol. Chem., 1937, 118, 331—335).— $\text{Th}(\text{NO}_3)_4$ catalyses dry ashing and prevents volatilisation of K so that by using a temp. of 750° ashing is completed in 15 min. Any soluble Th is pptd. in extracting the ash with H_3PO_4 , K being determined as platinichloride. The difference between results of Th and of H_2SO_4 ashing averages 2%, which is within the limits of accuracy of the K determination. The error in recovery of added standard solutions was $\pm 2.6\%$. R. M. M. O.

7-Iodo-8-hydroxyquinoline-5-sulphonic acid as a reagent for the colorimetric determination of ferric iron in biological products.—See A., I, 376.