

BRITISH CHEMICAL ABSTRACTS

A., III.—Biochemistry

OCTOBER, 1937.

Respiration in the dog. I. Alveolar air and respiratory data. J. ROOS and C. ROMIJN (Arch. Néerland. Physiol., 1937, 22, 233—256).—In female, but not in male, dogs under physiological conditions, the last portion of tidal air is alveolar air. By compressing the thorax at the end of a normal expiration, alveolar air can usually be obtained. During pregnancy and the 5 weeks following parturition, the CO_2 content of the alveolar air is approx. 0.6% <, and the O_2 content >, the normal val. The coeff. of ventilation is subject to large individual variations. A method of determining vital capacity and supplemental, complemental, and residual air is described.

W. MCC.

Fractionation of the output of the heart and of the oxygen consumption of normal unanæsthetised dogs. S. E. LEVY and A. BLALOCK (Amer. J. Physiol., 1937, 118, 368—371). R. N. C.

Alterations of alveolar carbon dioxide in man accompanying postural change. R. J. MAIN (Amer. J. Physiol., 1937, 118, 435—440). R. N. C.

Effects of inhalation of helium mixed with oxygen on the mechanics of respiration. A. L. BARACH and M. ECKMAN (J. Clin. Invest., 1936, 15, 47—61).—He decreased the effort of the respiratory musculature and lowered intrapleural pressure.

CH. ABS. (p)

Theophylline-ethylenediamine [euphyllin] in Cheyne-Stokes respiration. O. A. S. MARAIS and J. MCMICHAEL (Lancet, 1937, 233, 437—440).—The effect of euphyllin (I) in restoring periodic breathing to normal is due mainly to the $(\text{CH}_2\text{NH}_2)_2$ component, but (I) may act when $(\text{CH}_2\text{NH}_2)_2$ fails. Theophylline alone has no action.

L. S. T.

Toxicity of air exhaled by man. M. I. GARNITZKI and I. I. SIVERTZEV (J. Physiol. U.S.S.R., 1935, 19, 1265—1270).—Replacement of ordinary by exhaled air weakens the activity of the isolated frog heart. In addition to CO_2 other volatile substances, probably basic, are concerned. Air exhaled by old or sick persons is more toxic than that of young and healthy individuals.

CH. ABS. (p)

Oxygen and carbon dioxide content of the arterial and venous blood of normal subjects. J. M. LOONEY and E. M. JELLINEK (Amer. J. Physiol., 1937, 118, 225—231).—The normal mean val. of venous O_2 in samples collected by the method of Looney and Childs (see A., 1934, 314) is < the accepted vals., whilst venous CO_2 is higher. The levels of O_2 and CO_2 in both arterial and venous blood from the same subject vary widely at different times.

R. N. C.

Gases in blood during muscular work. I. N. N. BLOCHIN (J. Physiol. U.S.S.R., 1935, 19, 1258—1264).
CH. ABS. (p)

Physical structure of the red cell membrane, with special reference to its shape. E. PONDER (Trans. Faraday Soc., 1937, 33, 947—954).—The conditions causing transformation of mammalian red cells from disc to spherical form suggest that the normal disc shape is due to the action of surface components. The optical properties of the red cell envelope can be attributed to lipins and proteins, showing positive and negative birefringence, respectively, and it is inferred that the envelope comprises layers of protein particles with their long axes oriented tangentially, and interspersed lipid micelles with their optical axes oriented radially.

J. W. S.

Relationship between the permeability of the red cell and its metabolism. W. WILBRANDT (Trans. Faraday Soc., 1937, 33, 956—959).—Photoelectric investigation of the permeability of human erythrocytes shows that after a suspension of human blood (1 c.c.) in aq. NaCl (0.95%) + NaF (0.02N) (10 c.c.) has been kept at 37° for a few hr. its time of osmotic hæmolysis in isotonic glycerol solution is lengthened relative to that of a suspension in 1% aq. NaCl. The permeability for glycerol is unchanged, but the equilibrium is shifted considerably. The decrease in cell vol. shows that the shift in osmotic resistance is due to decrease in the amount of osmotically active substance in the cell. Evidence that the effect of NaF is due to a change of metabolism of the cells is summarised.

J. W. S.

Permeation of human erythrocytes by anions and cations. M. MAIZELS (Trans. Faraday Soc., 1937, 33, 959—964).—The relative permeation of anions into human erythrocytes has been determined by suspending the centrifuged cells in solutions containing equiv. amounts of KCl and another K salt (K_4). After 5 min. the suspension was centrifuged and the $[\text{Cl}']$ and $[\text{A}']$ were determined. At p_{H} 7 the permeation of inorg. ions follows the order $\text{I}^- > \text{CNS}^- > \text{NO}_3^- > \text{Cl}^- > \text{SO}_4^{2-} > \text{PO}_4^{3-}$. The least polar org. anions permeate most readily. The cells are almost impermeable to cations in salt solutions, but cation loss occurs in glucose solution. This loss cannot be restored in salt solutions and is due to a disturbance of a surface layer of ions or other constituent of the cell membrane.

J. W. S.

Base binding in erythrocytes. M. MAIZELS and J. L. H. PATERSON (Biochem. J., 1937, 31, 1642—1656).—Titration data for 0.55% aq. hæmoglobin

(I) indicate an isoionic point of p_H 7.12–7.15 at 25° and a mol. buffering power of 7.9–9.1 for the p_H range of 8.4–7.2 [mol. wt. of (I) taken as 67,000]. The p_H of washed, dialysed cell solutions is 0.3, and of anæmic cells 0.4–0.5, < that of pure aq. (I). In erythrocytes, part of the cation is combined with Cl^- and HCO_3^- and part (approx. $\frac{1}{3}$) with (I) and unknown, non-dialysable, probably complex ions, the latter being increased in anæmia. An increase in osmotic pressure of anæmic cells due to increased Cl^- and base contents does not occur owing to the increased H_2O content (A., 1936, 876). F. O. H.

Action of pterins and other substances on the composition of the blood of young animals suffering from dietary anæmia and of adult rats. R. TSCHESCHE and H. J. WOLF (Z. physiol. Chem., 1937, 248, 34–40; cf. this vol., 11).—Xanthopterin, erythropterin, leucopterin, guanopterin, and tyrosine (but not lactoflavin) exhibit the anti-anæmic effect (increase of erythrocyte and reticulocyte content). The active material obtained by the method of Subbarow *et al.* (A., 1936, 364) consists chiefly of xanthine (which is inactive) admixed with anti-anæmic material. The substance obtained by the method of Subbarow *et al.* (this vol., 8) is inactive.

W. McC.

Action of nitrite on hæmoglobin in the absence of oxygen. J. BROOKS (Proc. Roy. Soc., 1937, B, 123, 368–382).—In the presence of a reducing agent $NaNO_2$ forms with hæmoglobin (I) a compound showing the same absorption bands as the NO-(I) complex (II), 1 mol. of $NaNO_2$ completely reacting with 1 equiv. of reduced (I) at p_H 5.15–6.63. The rate of reaction decreases with rising p_H and is very slow at p_H 7.16–7.75. In the absence of both O_2 and reducing agent 1 mol. of $NaNO_2$ combines with 2 equivs. of reduced (I) yielding 1 equiv. of (II) and 1 equiv. of methæmoglobin. The latter is not formed in the reaction between NO and reduced (I). (II) is a Fe compound of the same type as oxyhæmoglobin and CO-hæmoglobin.

A. G. P.

State of carbon dioxide in solutions containing hæmoglobin. R. MARGARIA, P. ROWINSKI, and S. GOLDBERGER (Arch. Sci. biol., 1933, 18, 378–384; Chem. Zentr., 1936, i, 3698).—The solubility const. of CO_2 in such solutions deviates from the Henderson-Hasselbalch formula, varying with concns. of hæmoglobin, HCO_3^- , and dissolved CO_2 ; this is ascribed to formation of a CO_2 -hæmoglobin compound.

H. N. R.

Action of hæmoglobin on ascorbic acid. State of combination of ascorbic acid in erythrocytes. M. FISCHER (Biochem. Z., 1937, 292, 16–24; cf. Gabbe, this vol., 326).—Oxyhæmoglobin (I) combines with ascorbic acid (II), which is liberated by treating the complex with CO, CO_2 , or KCN. (II) also combines to a slight extent with CO- and CO_2 -hæmoglobin, with cryst. and reduced hæmoglobin, and with (I) in presence of KCN. After intravenous injection of large doses of (II), the complex appears in the blood.

W. McC.

Green derivative of hæmoglobin. S. EDL-BACHER and A. VON SEGESSER (Naturwiss., 1937, 25, 461–462).—When guinea-pig erythrocytes are in-

cubated in a stream of O_2 under PhMe at 38° with neutralised ascorbic acid (I) and $PO_4^{'''}$ buffer (p_H 7.2) a green froth appears after 30 min. and the whole liquid becomes deep green after 2 hr. After a short boiling with $2N-H_2SO_4$ the green colour may be extracted with $C_5H_{11}OH$. The amorphous deep green residue obtained after removal of solvent gives a Gmelin reaction similar to that of biliverdin (II). The possible identity of the green pigment with (II) suggests that (I) may play a rôle in the formation of bile pigments.

W. O. K.

Green derivative of hæmoglobin. S. EDL-BACHER and A. VON SEGESSER (Naturwiss., 1937, 25, 557).—The formation of the pigment (see preceding abstract) is not influenced by the addition of NaF, As_2O_3 , H_2AsO_4 , $MnSO_4$, or $CoCl_2$ but is restricted by CN^- . $CuSO_4$ facilitates so remarkably as to suggest a fundamental enzyme containing Cu.

H. W.

Iron. XIII. State of combination and physiological significance of "easily eliminated" iron. G. BARKAN and O. SCHALES (Z. physiol. Chem., 1937, 248, 96–116; cf. this vol., 4).—The fractions *E* and *E'* (which differ only in the state of oxidation of their Fe) of the "easily eliminated" Fe of blood are pseudohæmoglobins and are probably intermediates in the physiological conversion of blood-pigment into bile-pigment, the oxidative cleavage of the porphyrin ring being followed successively by conversion of *E* into *E'* ($Fe^{II} \rightarrow Fe^{III}$) and breakdown into bilirubin (I), Fe, and globin. *E'* combines with HCN (dil. HCl does not remove Fe from the complex produced) and is converted into *E* by reduction with $Na_2S_2O_4$. Conversely *E* yields *E'* on oxidation. *E*, but not *E'*, reacts with CO. The Fe of green hæmin (II) (Warburg and Negelein, A., 1930, 1199) is as easily eliminated as is the "readily eliminated" Fe of blood but CO does not inhibit Fe removal from (II). Hæmoglobin of blood solutions becomes green on successive addition of KCN and H_2O_2 . The green substance easily loses Fe but, after reduction, loss of Fe is inhibited by CO. Human plasma contains equimol. amounts of Fe and (I).

W. McC.

Sulphæmoglobinæmia, its cause and prevention. Treatment with sulphanilamide. H. E. ARCHER and G. DISCOMBE (Lancet, 1937, 233, 432–435).—The intracorpuseular sulphæmoglobinæmia associated with the administration of drugs derived from NH_2Ph results from the combination of hæmoglobin with the H_2S absorbed from the intestinal tract, a reaction catalysed by the drug circulating in the blood. The normal absorption of the products of protein digestion in the small intestine is reduced by purgation, causing increased putrefaction in the colon, and production of H_2S greatly in excess of the normal. Saline cathartics such as $MgSO_4$ are the most active in this process.

L. S. T.

Relation of protein to hæmoglobin building. P. B. PEARSON, C. A. ELVEHJEM, and E. B. HART (J. Biol. Chem., 1937, 119, 749–763).—Hæmoglobin (I) regeneration in rats with nutritional anæmia was investigated. With adequate amounts of Fe and Cu, liver, caseinogen, ovalbumin, and soya-bean oil-meal produced good (I) regeneration and growth. Rat's

blood afforded excellent (I) regeneration but the growth response was inconsistent. Maize gluten meal and wheat gluten were poor for both growth and (I) regeneration. Gelatin and gliadin were inadequate for growth and gave very poor (I) regeneration. The results indicate that the maintenance of normal (I) vals. is more vital than growth.

J. L. C.

Electrophoresis of [blood-]platelets. O. PINOTTI (Arch. Fisiol., 1937, 37, 97—100).—Micro-electrophoresis of plasmatic suspensions of platelets of various animals indicates that their surface potential is due to absorption of plasma-proteins (I) to an extent dependent on the character of (I); the nature of the charge is independent of dilution.

F. O. H.

Electrophoresis of serum-globulin. II. Electrophoretic analysis of normal and immune sera. A. TISELIUS (Biochem. J., 1937, 31, 1464—1477).—An improved electrophoresis apparatus (described), in which the potential gradient is greatly increased, permits rapid and complete separation of proteins and other high-mol. compounds into their components. The migrating boundaries are observed by a method depending on n . Serum is separable into albumin and three globulins: α , β , and γ . The mol. wt. of these globulins is the same but the isoelectric point of the α - and β -forms is at p_H 5.1 and of γ at 6.0. The mobilities are quite different especially at alkaline reactions. Investigation of a highly potent anti-ovalbumin serum from rabbit showed that the antibody function migrated with the γ -globulin only (cf. this vol., 111).

P. W. C.

Isoelectric point of human serum-albumin. E. KYLIN (Acta med. scand., 1936, 87, 536—550; Chem. Zentr., 1936, i, 3709—3710).—Cataphoresis of serum at p_H 4.6 separates the albumin into two fractions, one moving to each electrode. The anode fraction has an isoelectric point at p_H 4.0 and the cathode fraction at p_H 5.5.

A. G. P.

Retention of trichloroacetic acid by human serum-proteins. W. L. DULIERE and R. MINNE (Compt. rend. Soc. Biol., 1937, 125, 1040—1042).—Approx. 17% of the acid retained (550 mg. per g. of protein) is combined with the protein, the remainder being absorbed or occluded.

H. G. R.

Titrimetric determination of the proteins in human serum. W. L. DULIERE and R. MINNE (Compt. rend. Soc. Biol., 1937, 125, 1042—1044).—The protein is calc. from the quantity of $CCl_3 \cdot CO_2H$ retained in the coagulum after pptn. (cf. preceding abstract).

H. G. R.

Precipitation of serum-proteins by ammonium sulphate. Significance of fractionation at various concentrations of the salt. A. ROCHE, L. SAMUEL, and R. ARTHAUD (Compt. rend. Soc. Biol., 1937, 125, 1061—1064).—If the protein concn. is >1% the solubility of the individual proteins is altered. The optimum conditions for pptn. of the globulin are seven-fold dilution of the serum and pptn. by half-saturation with $(NH_4)_2SO_4$ at p_H 5.7 and 22°.

H. G. R.

Protein-bound sugar and blood-proteins in normal and pathological conditions. H. BERRY

(Compt. rend., 1937, 204, 1681—1683; cf. this vol., 164).—In man glucose + mannose (from plasma protein-bound sugar) is > the glucosamine content of plasma-proteins in many pathological states. This information may lead to the recognition of the association of individual proteins with sp. diseases.

J. L. D.

Preparation of fibrinogen from human blood. E. KYLIN and F. PAULSEN (Acta med. scand., 1936, 87, 442—453; Chem. Zentr., 1936, i, 3709).—Plasma in Ringer or physiological saline is placed in a U-electrolytic cell. Protein possessing all the properties of fibrinogen is isolated from the cathode liquid. The existence of oppositely charged fibrinogen fractions is discussed.

A. G. P.

Formation of fibrinogen. (A) In blood-plasma. (B) With reference to antibody production in plasma by the reticulo-endothelial system. P. CAMPPELLONE (Arch. Fisiol., 1937, 37, 101—124, 143—155; cf. A., 1936, 355).—(A) The action of injected dyes, As, and erythrocytes in increasing the fibrinogen (I) content of blood (dog, cat) is discussed with reference to the reticulo-endothelial origin of (I).

(B) The formation of both (I) and sp. antibodies is related to the activity of the reticulo-endothelial system.

F. O. H.

Factors influencing permanency of colloids in [blood-]circulation. I. Dyes and the coagulability of blood. A. CESTARI (Boll. Soc. ital. Biol. sperim., 1937, 12, 237—239).—Dyes (both electro-positive and -negative) injected into heparinised animals remain longer in circulation than in normal animals.

F. O. H.

Demonstration of a masked form of nitrogen specific to conditions of histolysis. J. LOISELEUR [with R. COLLIARD and C. CROVISIER] (Bull. Soc. Chim. biol., 1937, 19, 1059—1081).—When blood contains polypeptides, particularly under those pathological conditions in which histolysis occurs, much polypeptide is adsorbed by the plasma-proteins during pptn. with $CCl_3 \cdot CO_2H$. This polypeptide fraction can be recovered by elution and gives a measure of the degree of histolysis. It can be utilised for following changes of histolysis, e.g., under treatment by radiotherapy.

P. W. C.

Chromogenic tungstate and its use in determination of uric acid of blood. E. B. NEWTON (J. Biol. Chem., 1937, 120, 315—329).—The prep. of a highly chromogenic Li arsenotungstate is described, and the method in which it is used as a reagent for determination of uric acid (I) in blood is given and its advantages are discussed. It is necessary to separate (I) from other reactive substances in blood-filtrates.

J. N. A.

Progressive lipidosis. I. II. Separation of free cellular lipins. III. Free liver-phospholipins of guinea-pigs poisoned by diphtheria toxin. C. CIACCIO (Boll. Soc. ital. Biol. sperim., 1937, 12, 217—218, 218—219, 220—221).—I. The origin and distribution of cell-lipins are discussed.

II. The tissue is frozen, sliced, and extracted with

anhyd. Et_2O at 0° , the extract being purified by, *e.g.*, washing with cold dil. aq. $\text{CCl}_3\cdot\text{CO}_2\text{H}$.

III. The content is significantly increased.

F. O. H.

Regressive lipidosis. IV. Lipidosis due to diphtheria toxin in relation to body-temperature. V. Hepatic lipidosis due to diphtheria toxin after preventive treatment with colloidal silver. A. BASILE and F. ALFANO (Boll. Soc. ital. Biol. sperim., 1937, 12, 224—225, 226—227).—IV. During the injection in pigeons and rabbits, a high body-temp. is accompanied by a tendency to decreasing hepatic lipidosis and *vice versa*.

V. Treatment of rabbits with colloidal Ag diminishes lipidosis due to P poisoning but not that due to diphtheria toxin.

F. O. H.

Variations in lipæmia of normal subjects. E. B. MAN and E. F. GILDEA (J. Biol. Chem., 1937, 119, 769—780).—Serum-lipins in 10 normal subjects were examined for periods up to 4 years. Serum-cholesterol varied by 31, -lipin-P by 23, -fatty acids by 37, and -proteins by 14%. The variations in lipins were not related to concn. of the blood, slight changes in body-wt., menstrual cycle, or season of the year.

J. L. C.

Blood-cholesterol during experimental hypercholesterolaemia in normal and splenectomised animals. A. LICAS (Arch. Farm. sperim., 1937, 64, 130—136).—The hypercholesterolaemia, due to ingestion of cholesterol (I), in splenectomised rabbits is more marked and of longer duration than in normal rabbits. The histology of the spleen of the latter indicates it to be an organ of (I) deposition.

F. O. H.

Colour reaction of hexoses and polyhexoses: application to colorimetric determination of glucose in blood. J. A. SANCHEZ (Semana méd., 1935, II, 914—917).—Addition of 15 c.c. of H_2SO_4 to 5 c.c. of a glucose solution containing >0.0001 mg. produces an intense red coloration under the influence of the heat of mixing. The colour is given by hexoses and polyhexoses only and \propto their concn. Serum is treated with $\text{CCl}_3\cdot\text{CO}_2\text{H}$, filtered, diluted to 5 c.c., and after addition of 15 c.c. of H_2SO_4 is heated at 100° for 5 min. The colour is compared with standards prepared with deproteinised blood after incubation at 37° for 24 hr. The test is applicable to oxalated plasma but not to citrated serum.

CH. ABS. (p)

Distribution of glucose between blood cells and serum. K. A. KLINGHOFFER (Amer. J. Physiol., 1937, 118, 431—434; cf. Neuwirth; this vol., 248).

R. N. C.

Fermentable reducing substances (true blood-sugar) of the internal fluid of invertebrates. M. FLORKIN (Bull. Soc. Chim. biol., 1937, 19, 990—999).—A table summarises the total and the fermentable reducing substances of the plasma of the coelomic fluid and of the blood-plasma of a large no. of invertebrates.

P. W. C.

Glycolytic power of human blood. N. SABATINI (Pathologica, 1935, 27, 787—789).—Effects of various drugs (atropine, Synergen) on the vegetative

nervous system do not indicate that the system influences glycolysis *in vitro*.

CH. ABS. (p)

Determination of pyruvic acid in small quantities of blood. S. DE JONG and J. PICARD (Arch. Néerland. Physiol., 1937, 22, 117—122).—The author's modification of the Clift and Cook method (this vol., 103) is preferred to that of Dische and Robbins (A., 1934, 1016), which is not sp.

H. G. R.

Determination of alcohol in blood. K. WREDE and B. KRATZ (Chem.-Ztg., 1937, 61, 669—671).—In legal cases the determination of EtOH in blood should be entrusted only to competent chemists. A sufficiently large blood sample should be taken to ensure accuracy. The errors to which Widmark's method are liable, due, *e.g.*, to the possible presence of COMe_2 and $\text{CH}_3\text{Ac}\cdot\text{CO}_2\text{H}$ in the blood, are briefly discussed; doubtful results should be confirmed by an independent method, *e.g.*, that of Kionka.

A. B. M.

Chemical composition of blood of dairy cattle.

II. Effect of phosphorus intake on the calcium and inorganic phosphorus content of whole blood of dairy heifers during first gestation and lactation. A. H. V. LANDINGHAM, H. O. HENDERSON, and G. A. BOWLING (J. Dairy Sci., 1936, 19, 597—609).—With Holstein heifers, an intake of 11.8 g. of P (1.2 g. per 100 lb. live wt.) daily maintained the blood-inorg. P at normal level. At parturition the inorg. P decreased suddenly, especially with heifers on low-P diet. Combined milk production and low intake of P lowered the blood-inorg. P but low P had no effect on blood-Ca. P in the feed should exceed total P excretion in milk by 10 g. per day per 1000 lb. live wt.

W. L. D.

State of mineral substances in blood-serum.

II. Quantitative relationships between calcium and anion-forming constituents, protein, inorganic phosphoric acids, and carbonic acid in normal ox-serum. L. SEEKLES (Arch. Néerland. Physiol., 1937, 22, 93—107; cf. this vol., 84).—Various formulæ based on the law of mass action fail to express the diffusible Ca (measured by ultrafiltration experiments) in serum. The following empirical formula agrees with experimental data; $[\text{total protein} + \text{inorg. P}] \times [\% \text{ diffusible Ca}] = (6.838 \pm 0.493) \times 10^{-1}$ at p_H 7.3. As the inorg. P plays only a subordinate rôle it can be neglected and the const. becomes $(5.443 \pm 0.466) \times 10^{-1}$.

W. O. K.

Seasonal variation of serum-calcium in dogs. J. CHEYMOL and A. QUINQUAUD (Compt. rend. Soc. Biol., 1937, 125, 941—943).—Max. vals. were observed in spring and autumn irrespective of the sex of the animal.

H. G. R.

Changes in the plasma and cells during experimental human salt deficiency. R. A. McCANCE (Biochem. J., 1937, 31, 1278—1284).—Experimental salt deficiency in man produced by diet and sweating led to a fall in serum-Na and -Cl. K^+ , Cl^- , and possibly Na^+ pass from the red blood cell to the plasma. The vals. for serum-proteins, hæmoglobin, and cell vol. of the whole blood increase. Restoration of a free NaCl intake causes these vals. to sink below their initial levels.

J. L. C.

Photo-electric determination of potassium in minute quantities of serum. W. S. HOFFMAN (J. Biol. Chem., 1937, 120, 57—61).—A photo-electric modification of the Jacobs-Hoffman colorimetric method (A., 1932, 102) is described. Slight alterations in the reagents and washing procedures are also recorded. R. M. M. O.

Determination of water content of blood. I. A. SMORODINCEV and L. M. REIN (J. Appl. Chem. Russ., 1937, 10, 1140—1141).—10 ml. of blood are distilled with 100 ml. of H_2O -saturated PhMe, and the amount of H_2O separating from the distillate is measured. R. T.

Acid production in the functioning heart under conditions of ischæmia and of congestion. R. M. MOORE and M. M. GREENBERG (Amer. J. Physiol., 1937, 118, 217—224).—Ligation of the coronary arteries in the dog and cat causes a fall of p_H and a rise of lactic acid in the coronary venous blood. Ligation of the cardiac veins scarcely affects coronary venous p_H . R. N. C.

Effect of alkalisation of drinking water on the p_H of jugular blood of feeder cattle. P. GERLAUGH, C. H. HUNT, and B. H. EDGINGTON (Ohio Agric. Exp. Sta. 53rd Ann. Rept. Bull., 1935, No. 548, 78).— H_2O containing 1% $NaHCO_3$ increased jugular blood- p_H by 0.14 and 0.17 units but had no influence on the occurrence of disease. CH. ABS. (p).

Rate of evaporation in serum as a measure of vapour pressure, osmotic pressure, and concentration of solutes. R. W. CULBERT, D. J. McCUNE, and A. A. WEECH (J. Biol. Chem., 1937, 119, 589—906).—Comparison is made of data obtained, by the Hill method of measuring v.p., from 53 samples of human sera, with determinations of total base, non-protein-N, and protein. Analysis of the data by the method of multiple correlation indicates that a high degree of correlation exists between the measured rate of evaporation and the total v.p. and osmotic pressures of the sera. Regression equations are given relating the various quantities. F. A. A.

Hæmolysis by various substances which liberate hydrochloric acid. H. MAGNE and H. TRIMBACH (Bull. Soc. Chim. biol., 1937, 19, 1082—1091).—A method is given for measuring the degree of hæmolysis by HCl and by substances which not only effect hæmolysis but also attack the liberated hæmoglobin. $COCl_2$, $S(CH_2CH_2Cl)_2$, and $N(CH_2CH_2Cl)_3$ HCl hæmolyse only to the extent that they liberate HCl. If the acid is neutralised as formed by buffering or if hydrolysis to give HCl is prevented by the presence of the other hydrolysis products, hæmolysis does not occur. P. W. C.

Tissue extracts and blood coagulation. F. R. DAVISON (Amer. J. Physiol., 1937, 118, 633—640).—Clotting does not occur with tissue extracts if the thrombin mechanism is interfered with, or when purified tissue extracts, Ca, and purified fibrinogen are mixed. The clotting reported with tissue extracts is considered to have been due to impurities in the reagents. R. N. C.

Effect of variations in total calcium concentration on the coagulation time of blood. M. M. CRANE and H. N. SANFORD (Amer. J. Physiol., 1937, 118, 703—707).—The time is practically const. when total Ca lies between 5 and 20 mg. per 100 c.c., but is considerably prolonged if Ca is <2.5 mg. The relation between Ca and coagulation time is not affected by variations in plasma-proteins. R. N. C.

Problems of asymmetry in processes of immunity. M. SCHOEN (Ann. Ferm., 1937, 3, 30—51).—A crit. review.

Reactions of hæmolysins on immunisation with blood mixtures. J. MAGERL (Z. Immunitäts., 1937, 90, 327—338).—After immunisation of rabbits with blood mixtures multivalent hæmolysins were found. Mixtures of sheep and horse bloods proved more efficient than either alone or blood of other animals. Six days after the last injection the titre decreased, but rose again after injection of chicken blood; yeast had no such effect. C. R. S.

Variability of the properties of tetanus antitoxin. G. RAMON, E. LEMÉTAYER, and I. PIROSKY (Compt. rend. Soc. Biol., 1937, 125, 967—970).—Neutralisation of the toxin by antitoxin from an animal injected with sp. anatoxin previous to hyperimmunisation is much more rapid than when no previous treatment is given. H. G. R.

Intrinsic antigenic value and immunising power of staphylococcus anatoxin. G. RAMON, R. RICHOU, and M. ROUCHDI (Compt. rend. Soc. Biol., 1937, 125, 970—974).—The immunising and therapeutic activity of staphylococcus anatoxin cannot be evaluated precisely *in vivo* as a function of the intrinsic antigenic power. H. G. R.

Chemical nature of so-called syphilis antigens. I. Elimination of an inactive fraction. Ö. FISCHER (Z. Immunitäts., 1937, 90, 348—352).—Alcoholic extracts from bovine hearts treated with 20% of H_2O and 0.01N-HCl gave a ppt. which showed no reaction with serum of lues. From the liquid an antigen could be extracted with light petroleum. C. R. S.

Immunising fractions isolated from *Hæmophilus pertussis*. J. C. CRUICKSHANK and G. G. FREEMAN (Lancet, 1937, 233, 567—570).—An antigenically active fraction with immunising potency in mice apparently equal to that of whole bacterial cells from a virulent phase I strain has been isolated. The fraction contains no intact protein, and can be stored as a readily sol. powder. L. S. T.

Distribution of ash in spodograms of normal human skin. G. RIVELLONI (Boll. Soc. ital. Biol. sperim., 1937, 12, 144—146).—The spodograms (cf. Barigozzi, this vol., 167) of various cutaneous tissues are correlated with their histological characteristics. F. O. H.

Mineral substances of chromosomes of the salivary glands of *Diptera* in relation to the probable distribution of genetic factors. C. BARIGOZZI (Boll. Soc. ital. Biol. sperim., 1937, 12, 208—209).—Spodograms (cf. this vol., 167) of sections of the glands of *Chironomus thummi* were examined. F. O. H.

Composition of the liver-fats of some New Zealand farm animals. T. P. HILDITCH and F. B. SHORLAND (Biochem. J., 1937, 31, 1499—1515).—Methods of separating phosphatide and glyceride lipins are investigated. Data for various fractions of the liver-lipins of ox, cow, pig, and sheep are tabulated. The non-phosphatide fatty acids are characterised by the presence of 5—10 mol.-% of hexadecenoic acid (I) and 5—15 mol.-% of highly unsaturated C_{20-22} acids, the proportions being > those in depot fats; the two types of fat are otherwise similar. The phosphatides are characterised by their content of stearic and unsaturated C_{20-22} acids whilst that of (I) is diminished; the fatty acids also tend to have a higher mol. wt. Linoleic acid is absent from the liver-fatty acids of ox and cow but traces occur in those of pig and, together with linolenic acid, of sheep.

F. O. H.

Wax of white pine cherms.—See A., II, 398.

Cholesterol in rabbit's skin during experimental hypercholesterolaemia. G. G. VILLELA (Compt. rend. Soc. Biol., 1937, 125, 1097—1098).—The skin-cholesterol is increased.

H. G. R.

Molecular structure of horse muscle-glycogen.—See A., II, 400.

Water-insoluble form of acetylcholine in the central nervous system. O. LOEWI (Naturwiss., 1937, 25, 461).—Only a small fraction of the acetylcholine (I) present in the central nervous system can be extracted with Ringer's solution containing eserine. A larger quantity is obtained from the H_2O -insol. residue, by extraction with EtOH or EtOH-HCl. Whereas the H_2O -sol. (I) is insol. in Et_2O , the H_2O -insol. variety from the central nervous system is Et_2O -sol.

W. O. K.

Constitution of octopine, a nitrogenous substance from the muscle of *Octopoda*.—See A., II, 403.

Melanins. I. Photosynthetic melanins. M. SPIEGEL-ADOLF (Biochem. J., 1937, 31, 1303—1310).—Tryptophan, phenylalanine, and tyrosine on irradiation under suitable conditions with light of short λ formed melanins which were isolated and purified and showed slight differences in solubility, in reaction with H_2O_2 , and in optical absorption, the extinction coeffs. decreasing for the melanins of the NH_2 -acids above in the order given.

P. W. C.

Determination of proline in protein hydrolysates. R. ENGELAND and A. BASTIAN (Bull. Soc. Chim. biol., 1937, 19, 1126—1128).—The method consists of methylation and conversion of the formed stachydrine into platinichloride and aurichloride.

P. W. C.

Trypsin-peptone ("tryptone"). F. ITZIOKA (J. Biochem. Japan, 1937, 25, 329—337).—Caseinogen, hydrolysed as far as possible by kinase-activated pancreatic juice (rabbit) at p_H 7.5, yields a peptone (tryptone) (I), the pptn. reactions of which are described. (I) is further hydrolysed by pancreatic macerate-juice, liver, kidney, and mucosa of the small intestine at slightly alkaline reactions (with kidney, also at p_H 4.5), the hydrolysis being due to peptidases.

F. O. H.

Chemical nature of acid groups of proteins. M. LISSITZIN (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 75—81).—Acidity of casein is ascribed to the presence of aminodicarboxylic acids.

CH. ABS. (p)

Determination of [amino-acid] coefficient D . I. A. SMORODINCEV and S. A. PAVLOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 487—490).—For the pptn. of proteins 100 c.c. of the solution are treated with 1% $Al_2(SO_4)_3$ (25 c.c.) and 0.1N-KOH [x c.c., the amount required to neutralise the 25 c.c. of $Al_2(SO_4)_3$ to bromothymol-blue as determined by previous test]. 50 c.c. of the filtrate are titrated with 0.1N-KOH in presence of phenolphthalein until a faint reddish colour develops (E c.c.). Alcohol (55 c.c. of 96%) is added and the titration is continued until the pink colour reappears (F c.c.). Coeff. D is calc. by the formula $D = (F - E)(125 + x)/125$ (cf. B., 1937, 82).

W. O. K.

Adsorption of polypeptides by proteins. Behaviour of peptone in solution. J. LOISELEUR (Compt. rend., 1937, 205, 93—94).—The protein-free filtrate from a solution of Witte's peptone (I) contains N, the amount of which increases as the concn. of (I) decreases. The total N is not determined, probably because part of it is adsorbed on the colloid.

J. L. D.

Structure of protein monolayers. Protein films.—See A., I, 511.

"Anti-complex" of egg white. S. S. PEROV (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 64—74).—Addition of alkali to dialysed egg-white causes a decrease in γ and an increase in η . The "anti-complex" thus indicated was not isolated.

CH. ABS. (p)

Titration curves of amino-acid mixtures. M. LISSITZIN and P. DIATSCHENKO (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 90—92).—Identical titration curves are obtained for a mixture of monoaminodi- and diaminomono-carboxylic acids in the proportions in which they occur in casein.

CH. ABS. (p)

Stanek and Hausmann numbers of some "proto-acids." I. LEONTEV and G. GLUCHAREV (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 93—101).—"Proto-acids" of casein, egg white, peas, and *Phaseolus aureus* yield approx. the same amounts of NH_3 -, NH_2 -, $(NH_2)_2$ -, and humus-N (Hausmann's method) and consume the same amounts of HIO_3 on oxidation by Stanek's method.

CH. ABS. (p)

Chemistry of the neuroproteins. I. Amino-acid composition of various mammalian brain-proteins. R. J. BLOCK (J. Biol. Chem., 1937, 119, 765—768).—Proteins prepared from the brains of man, monkey, ox, sheep, rat, and guinea-pig gave the following average vals.: N 13.6, histidine 2.4, lysine 4.3, arginine 5.1, cystine 1.4, tryptophan 1.2, and tyrosine 3.9%. All six brain-proteins contained approx. the same relative proportions of these NH_2 -acids, although the abs. amounts varied.

J. L. C.

Sulphur distribution of proteins. K. BAILEY (Biochem. J., 1937, 31, 1396—1405).—For pure proteins, Lugg's modification (A., 1933, 266) of the

Folin-Marenzi method is advocated as a measure of total disulphide (I), and for the determination of cystine (II) by a sp. method, Lugg's modification (*ibid.*, 814) of Sullivan's method is recommended, provided that the (II) content of the protein is $>0.5\%$. For determination of methionine (III), a modification of Baernstein's method (A., 1936, 1282) was employed. In hydrolysates of edestin (IV) and gliadin (V), the S unaccounted for in terms of total (I) and (III) amounts to 6—7% of the total S. The S of wool and kemp is almost wholly attributable to (II) and (III). In scoured samples of wool and kemp, the (II) content is low probably owing to oxidation of the S-S linking. The (II) figure obtained for (IV) and (V) is always $<$ that expected on the basis of its (I) content although (II) added to (IV) and (V) before hydrolysis is quantitatively determined by the methods employed. Hydrolysis of proteins in presence of pentose results in the production of large amounts of S-containing humin. The results are discussed in relation to the S distribution of the grass-proteins. W. O. K.

Copper in liver-proteins. Z. GRUZEWSKA and G. ROUSSEL (*Compt. rend. Soc. Biol.*, 1937, 125, 957—958).—Albumin and globulin fractions, the former containing Cu, were obtained from the livers of sheep and calf embryos. H. G. R.

Mercury and its salts in protein media. L. CALLEGARI (*Boll. Soc. ital. Biol. sperim.*, 1937, 12, 139—140).—Aq. ovalbumin dissolves 0.0075, 0.0225, and 0.034% of Hg, Hg_2Cl_2 , and (yellow) HgO , respectively. The vals. are modified by addition of alkalis or oxidising or reducing agents. F. O. H.

Crystalline protein with high lactogenic activity. A. WHITE, H. R. CATCHPOLE, and C. N. H. LONG (*Science*, 1937, 86, 82—83).—The method of isolation from anterior lobe fractions of the pituitary is described. The X-ray diffraction pattern is given. The crystals, C 51.11, H 6.76, N 14.38, and S 1.77%, are hygroscopic. P is absent. The protein appears to be identical with the lactogenic hormone of the anterior pituitary. When injected daily at a 4 mg. level into hypophysectomised rats, it does not stimulate growth. L. S. T.

Nature of paranuclein. II. Comparison of the peptic digestion products of various phosphoproteins. III. Interrelationship of its component fractions. J. D. HERD (*Biochem. J.*, 1937, 31, 1478—1483, 1484—1487).—II. Fractionation of the products obtained by peptic digestion of various phosphoproteins, viz., caseinogen, vitellin, ichthulin, and batrachiolin, showed that in each case peptic digestion was accompanied by the appearance of cleavage products of different N/P ratios with a higher % of P in the less sol. fractions. That the presence of P was responsible for the resistance to pepsin was confirmed by experiments with proteins phosphorylated by POCl_3 . Pseudonuclein is a loosely bound mixture of these resistant highly phosphorylated compounds.

III. The amount of paranuclein obtained from caseinogen is greatly increased by digestion at a p_H away from the optimum for digestion. Temp. has no effect. There is no evidence of any one const. fraction (*cf.* A., 1936, 1404). P. W. C.

Y* (A., III.)

(A) Sheath components of giant nerve fibres of the squid. (B) Ultrastructure of nerve axoplasm. (C) Protein constituents of nerve axoplasm. R. S. BEAR, F. O. SCHMITT, and J. Z. YOUNG (*Proc. Roy. Soc.*, 1937, B, 123, 496—504, 505—519, 520—529).—(A) Examination by polarised light shows the presence in the giant nerve fibre of a myelin-containing layer, similar to that of vertebrate fibres.

(B) The giant axons of the squid contain micelles having anisodiametric shapes as well as intrinsic crystalloidal structure. Immersion experiments indicate that the birefringence of axoplasm is too weak to be due to all the protein existing as well-oriented rodlet micelles. Supplementary data support the conclusion that the optical properties are determined by a small well-oriented fraction of the protein content.

(C) Pure axoplasm can be obtained from the giant axons of the squid. The protein isolated (neuronin) is a complex of several components. Its solubility and chemical properties are identical with those of proteins from other nervous tissue. E. M. W.

Micro-determination of gelatin and collagen content of muscles from normal and dystrophic rabbits. H. C. SPENCER, S. MORGULIS, and V. M. WILDER (*J. Biol. Chem.*, 1937, 120, 257—266).—A micro-method for conversion of muscle collagen (I) into gelatin (II) and determination of (II)-N is described. The (I) content of the gastrocnemius, biceps femoris, and triceps brachii in growing rabbits, and also the % of total N in form of (II)-N, are independent of the age of the animal. With marked nutritional muscle-dystrophy, the muscles contain 2 to 2.5 times as much (I) as controls; in the early stages, (I) increases before any apparent external signs. J. N. A.

Composition of the myosins and myogen of skeletal muscle. K. BAILEY (*Biochem. J.*, 1937, 31, 1406—1413).—The myosins (I) from the muscles of rabbit, dog, ox, or chicken have almost identical chemical composition and contain N 16.6—16.7 (of which 7.00—7.23 is amide-N), tyrosine (II) 3.22—3.38, tryptophan 0.76—0.84, S 1.06—1.12, methionine 3.35—3.43, and cystine (III) 0.72—0.85 or 0.58—0.74% according to the method employed. The (I) of fish or lobster contained slightly more (II) and (III) but were evidently of the same general type as those of mammals and birds. Rabbit's myogen differs considerably in composition from the above (I).

W. O. K.

Thermoelastic properties of muscle and their molecular interpretation. K. H. MEYER and L. E. R. PICKEN (*Proc. Roy. Soc.*, 1937, B, 124, 29—56).—The effect of temp. change on the elastic force exerted by a stretched, unstimulated muscle at const. length is investigated. At small and large elongations the temp. coeff. is negative but at intermediate elongations is positive, the elastic force increasing more rapidly than the abs. temp. X-Ray studies show that the degree of orientation in the muscle substance is augmented by stretching and diminished by warming. A mol. interpretation of the viscous-elastic properties of muscle is given and supported by experimental evidence. The elastic

system of muscle behaves as if composed of two components, flexible protein chains forming a three-dimensional network and free chains in the meshes of this net.

P. W. C.

Elastic properties of mother-of-pearl. P. S. SRINIVASAN (Proc. Indian Acad. Sci., 1937, 5, A, 463—483).—The elastic properties of the mother-of-pearl of various species of molluscs have been measured. The distribution of conchyolin (the cementing protein) in *M. Margaritifera* is deduced from a consideration of the elastic modulus in terms of the elastic moduli of the component materials and their distribution.

F. J. L.

Solubility of collagens. E. FAURÉ-FRÉMIET and C. BAUDOUY (Bull. Soc. Chim. biol., 1937, 19, 1134—1136).—Most collagens can be dissolved in $\text{HCO}\cdot\text{NH}_2$ (I) giving 1—2% solutions and the protein can be reprecipitated by dilution with H_2O , EtOH, or COMe_2 . (I) will dissolve 16—28% of desiccated tendon and >81% of the fresh tissue. Dissolved collagen can also be recovered by dialysis against H_2O , when rigid gels are obtained.

P. W. C.

X-Ray study of an intracellular protein. G. CHAMPETIER and E. FAURÉ-FRÉMIET (Compt. rend., 1937, 204, 1901—1903).—The X-ray diffraction pattern (two circles of equidistances 10 and 4.6 Å.) of ascaradin (I) separating from a cooled solution shows it to be isotropic with the protein in the cytoplasm of the living cell. When dehydrated (I) is semi-cryst. Freshly pptd. (I) containing much H_2O , or (I) made into a paste with $\text{HCO}\cdot\text{NH}_2$, gives a pattern with three circles with equidistances of 10, 4.6, and 3.6 Å. which reverts to the above type as H_2O is lost. (I) is pptd. from solution in the non-cryst. condition, but later becomes semi-cryst.

J. L. D.

Isoelectric point of fibroin of Chinese silk. C. WANG and T. T. WOO (J. Chinese Chem. Soc., 1937, 5, 170—173).—The isoelectric point of the fibroin of Chinese mulberry silk is p_{H} 2.4—2.6 and is probably independent of origin (cf. B., 1930, 653); the val. for Chinese tussah fibroin is p_{H} 4.2—4.4.

J. G. A. G.

Chemical nature of the granules in mast cells. P. GOMARASCA (Boll. Soc. ital. Biol. sperim., 1937, 12, 182—183).—Staining tests indicate the presence of glucoproteins of a mucoid character.

F. O. H.

Extraction from the meal-moth *Ephestia kuehniella* of the gene A-hormone producing dark-coloured eyes. E. BECKER (Naturwiss., 1937, 25, 507).—From the black-eyed females of the meal-moth of constitution AA, an extract has been obtained which, on injection, brings about the darkening of the eyes of the red-eyed mutants (aa).

W. O. K.

Casein, a mixture of several proteins. P. M. BUGAI (Trav. Inst. Chim. Charkov, 1935, 1, 69—80).—Caseinogen may be separated electrophoretically or chemically into a no. of fractions of different solubility.

R. T.

Action of sunlight on milk. L. BURUJANĂ (Biochem. J., 1937, 31, 1452—1458).—In milk sunlight brings about oxidation of unsaturated fat and also oxidation by catalytic dehydrogenation of the ascorbic acid (I) present. The former reaction is

independent of and the latter is responsible for the decolorisation of methylene-blue. The decolorisation is aided by oxidation of fat which produces the anaerobic conditions in the milk necessary for decolorisation to occur. Determination of substances oxidisable by (I) before and after exposure to sunlight gives (I) vals. comparable with those obtained by direct dichlorophenol-indophenol titration. With the exception of mare's milk, the milks examined did not contain reduced glutathione.

P. W. C.

Characteristics of buffalo and sheep milk. M. KOTSCHOPOULOS (Milch. Forsch., 1937, 19, 7—14).—Buffalo milk (total solids 17—18%) obeys Fleischmann's formula for calculation of total solids from fat % and d . Buffalo (74%) and sheep milk (76%) possess a higher H_2O -insol. fraction of ash than cow milk (63%). Buffalo milk gives a positive EtOH test, average η , and a normal distribution of microflora. Sheep's milk has high η and a higher EtOH-titration val. than cow's milk.

W. L. D.

Effect of intravenous injections of sugar on the lactating cow. W. R. BROWN, W. E. PETERSEN, and R. A. GORTNER (J. Dairy Sci., 1936, 19, 177—184).—Injections of glucose and fructose cause hypoglycæmia and of lactose, hyperglycæmia, and are of doubtful val. in studying lactose synthesis.

W. L. D.

Intra-mammary duct injections in the study of lactose formation. W. R. BROWN, W. E. PETERSEN, and R. A. GORTNER (J. Dairy Sci., 1936, 19, 243—256).—Such injections of glucose and lactose produced hyperglycæmia in cows, with a slightly increased lactose secretion. The amount of injected sugar must be large so that sufficient enters the blood to exhaust the increased supply of insulin or hypoglycæmia causing tremors will result. Diuresis follows the tremors. Colostrum is regarded as an equilibrium product of milk secreted normally rather than as a special secretion.

W. L. D.

Factors influencing the acidity of fresh cow's milk. W. J. CAULFIELD and W. H. RIDDELL (J. Dairy Sci., 1936, 19, 235—242).—With 811 samples from 60 cows the average acidity of each breed's milk was: Ayrshire 0.160, Holstein 0.161, Guernsey 0.172, and Jersey 0.179% (average of all breeds, 0.166%). Individual cows gave the range 0.098—0.295%. The acidity of colostrum was high for first-drawn but rapidly diminished subsequently. Milk from a group of 36 cows showed a gradual decrease throughout the lactation. The acidity fell markedly in the first and last months. Diurnal and monthly variations were not significant.

W. L. D.

Influence of the preceding dry period and of mineral supplement on lactation. P. T. D. ARNOLD and R. B. BECKER (J. Dairy Sci., 1936, 19, 257—266).—Max. yields from Jersey cows follow a dry period of 31—60 days whilst shorter periods or periods >91 days give lower milk yields. In 73 cases, the use of 2% of bone meal in the concentrates of a ration increased yields by 45% over those on low-Ca rations. The rate of decline in yield is influenced by the Ca content of the ration.

W. L. D.

Determination of lactoflavin by fluorescence measurements. G. C. SUPPLEE, S. ANSBACHER, G. E. FLANIGAN, and Z. M. HANFORD (J. Dairy Sci., 1936, 19, 215—220).—The prep. of pure lactoflavin (I) from a H_2O -sol. vitamin concentrate of milk is described. A method of determining (I) by comparing its fluorescence in suitably filtered ultra-violet light with that of a standard is described. 1×10^{-7} g. can be determined and 5×10^{-8} g. detected by this method.

W. L. D.

"Normal" lead [content] of cow's milk and milk preparations. M. KASAHARA, S. I. NOSU, R. KAWAMURA, and H. FUJII (Jahrb. Kinderheilk., 1936, 147, 357—359; cf. A., 1936, 501).—In Japan, cow's milk normally contains 0.01—0.59 mg. of Pb per litre. The corresponding vals. for sterilised, skimmed, dried, and condensed milk are 0.3—0.46, 0.06—0.26 mg. per litre and 0.17—3.26 and 0.134—4.59 mg. per kg., respectively.

W. McC.

Flow and protein content of subcutaneous lymph in dogs of different ages. R. HOLMAN (Amer. J. Physiol., 1937, 118, 354—358).—Lymph-protein does not vary significantly with age.

R. N. C.

Total carbon dioxide content of [cerebrospinal] fluid. M. KASAHARA and I. YASUDA (Z. ges. Neurol. Psychiat., 1936, 154, 621—625).—In dogs, the CO_2 content of the fluid and of the blood are greatly decreased by fasting or administration of HCl , H_3PO_4 , or lactic acid and increased by administration of $NaHCO_3$ or Na_2CO_3 , the CO_2 content of the blood being more rapidly affected than that of the fluid.

W. McC.

Seminal fluid. I. p_H of normal human seminal fluid. V. ZAGAMI (Atti R. Accad. Lincei, 1937, [vi], 25, 268—277).—The fluid, at 18° and in absence of air, has p_H 7.50—7.74 (mean 7.58); on keeping (up to 80 hr.) in absence and presence of air, the p_H decreases and increases, respectively, the spermatozoa dying only in the latter instance.

F. O. H.

Seminal vesicles of the goby. Chemistry and physiology of the vesicular fluid. R. T. YOUNG and D. L. FOX (Proc. Nat. Acad. Sci., 1937, 23, 461—467).—The vesicular fluid of *Gobius minutus* consists mainly of secondary, and traces of primary, proteoses. It does not lengthen the life of the corresponding spermatozoa *in vitro*.

E. M. W.

Amylolytic activity of saliva in dogs. R. DE MARCO (Arch. Fisiol., 1937, 37, 56—68).—The saliva has a slight amylolytic activity, that of mixed being > that of parotid saliva. Small variations occur during fasting, whilst the activity \propto the no. of epithelial cells present.

F. O. H.

Aqueous and mineral fraction of saliva during continuous secretion. P. J. MUCHINA (Med. exp. Ukraine, 1935, No. 2, 74—89).—Continuous secretion from submaxillary glands in dogs was secured by cutting the spinal cord and injecting Ringer solution periodically. The decrease in total solids in successive fractions of the secretion was largely at the expense of the org. constituents.

Ch. Abs. (p)

Colorimetric micro-determination of deoxycholic acid and cholic acid in bile. Y. ABE (J. Biochem. Japan, 1937, 25, 181—191).—Both acids give a pink colour when heated with vanillin (I) and 89% aq. H_3PO_4 (d 1.750) whilst with (I) and 78% aq. H_3PO_4 (d 1.625) only cholic acid gives the colour reaction. A method of determination based on this phenomenon and tables for the application of the step-photometer are given.

F. O. H.

3-Hydroxy-7-ketocholanic and chenodeoxycholic acids in guinea-pig's bile. I. IMAI (Z. physiol. Chem., 1937, 248, 65—68; cf. Iwasaki, A., 1937, II, 20).—The bile yields palmitic acid, taurine, chenodeoxycholic acid, and small amounts of 3-hydroxy-7-ketocholanic acid (acetate, m.p. 166—167°).

W. McC.

β -Hyodeoxycholic acid from pig's bile. T. KIMURA (Z. physiol. Chem., 1937, 248, 280—284; cf. Wieland *et al.*, A., 1933, 504; Windaus *et al.*, A., 1926, 723).—Pig's bile, after removal of α -hyodeoxycholic acid and 3-hydroxy-6-ketoallocholanic acid, yields β -hyodeoxycholic acid (I) (β -3- α -6-dihydroxycholanic acid), m.p. 189—190°, $[\alpha]_D^{25} +5.13^\circ$ in EtOH (K salt; Na salt, $[\alpha]_D^{25} 5.45^\circ$ in H_2O ; Me ester). (I) with CrO_3 in AcOH at room temp. gives α -dehydrohyodeoxycholic acid, converted by 5% aq. Na_2CO_3 at 100° for 3 hr. into β -dehydrohyodeoxycholic acid, which with PtO_2-H_2 gives β -3- α -6-dihydroxyallocholanic acid. (I) with CrO_3 in AcOH at 0° gives β -3-hydroxy-6-ketocholanic acid, m.p. 154° (Me ester, m.p. 146°), converted by 5% aq. Na_2CO_3 (100° ; 3 hr.) into β -3-hydroxy-6-ketoallocholanic acid.

W. McC.

Constitution of trihydroxyisosterocholanic acid.—See A., II, 420.

3-Hydroxy-6-ketoallocholanic acid and synthesis of α :6-dihydroxyallocholanic acid.—See A., II, 420.

Effect of pylorectomy on the strength of the acid secreted by the fundus. C. M. WILHELMJ, F. T. O'BRIEN, and F. C. HILL (Amer. J. Physiol., 1937, 118, 505—509).—Pylorectomy in dogs causes a fall in the quantity of HCl secreted, but does not affect its concn. Partial gastrectomy results in the appearance of mucus containing much neutral Cl^- ; the amount of mucus rises as HCl secretion falls. It does not appear in pylorctomised whole-stomach pouches.

R. N. C.

Acid inhibition of the intestinal and intragastric chemical phases of gastric secretion. C. M. WILHELMJ, H. H. MCCARTHY, and F. C. HILL (Amer. J. Physiol., 1937, 118, 766—774).—The presence of 0.1N- HCl in the stomach does not affect the intestinal phase of acid secretion, but the acid on passing into the duodenum at once inhibits it completely. When the intragastric and intestinal phases are combined, 0.1N- HCl does not usually inhibit acid secretion.

R. N. C.

Preparation and biological assay of enterogastrone. J. S. GRAY, W. B. BRADLEY, and A. G. IVY (Amer. J. Physiol., 1937, 118, 463—476).—Active preps. of enterogastrone are obtained by the following method. The duodenal mucosa of the pig

is extracted with 0.4% HCl and the extract saturated with NaCl. The ppt. is suspended in H₂O and p_H adjusted to 5.5. The solution is boiled, filtered, and the ppt. re-extracted with H₂O. The combined filtrates are pptd. with tannic acid, the ppt. is removed by centrifuge and decomposed with 60% COME₂ and HCl. The insol. residue is removed by centrifuge and re-extracted with 60% COME₂. The active material is pptd. from the solution with further COME₂, washed with COME₂ and MeOH, and dried. Fractionation by EtOH, isoelectric pptn. at p_H 8.4, C₆H₅N or picric acid pptn., and PhOH extraction fail to purify it further. The extract exhibits an apparently sp. inhibitory action on gastric motility and secretion. R. N. C.

Determination of urinary sulphur. L. CALLEGARI (Boll. Soc. ital. Biol. sperim., 1937, 12, 140—141).—Free SO₄'' is determined in urine (5 c.c.) by removing PO₄''' as MgNH₄PO₄, adding N-BaCl₂, pptg. excess of BaCl₂ as BaCrO₄, and determining CrO₄'' in the ppt. iodometrically. Combined and total S are determined by applying the above method to the urine after hydrolysis with HCl and oxidation of the conc. urine with HNO₃, respectively.

F. O. H.

Rapid [micro-]method for the direct determination of urea in urine. S. W. COLE (Lancet, 1937, 233, 575—576).—A modification of the method previously given (A., 1931, 1444) is described.

L. S. T.

Urine at hourly intervals after the administration of glycine. M. ADAMS, M. H. POWER, and W. M. BOOTHBY (Amer. J. Physiol., 1937, 118, 562—568).—Human subjects fed with glycine show an increased excretion of creatine; the effects are similar for normal subjects and patients with muscular disorder. Excretion of S compounds and inorg. salts is unaffected. R. N. C.

Presence of histidine in human urine. H. GERTLER (Endokrinol., 1936, 17, 45—47; Chem. Zentr., 1936, i, 3712).—Histidine is usually detectable in the later but seldom in the earlier months of pregnancy. A. G. P.

Presence of a substance similar to histamine in urine of pregnant women. G. UNGAR and J. DUBOIS (Compt. rend. Soc. Biol., 1937, 125, 963—965).—Histamine, in quantities of 0.01—1.6 mg. per litre (as hydrochloride), was observed in approx. 50% of the patients, the max. frequency occurring in the middle of pregnancy. H. G. R.

Urinary excretion of cholesterol. A. BUTENANDT and H. DANNENBAUM (Z. physiol. Chem., 1937, 248, 151—154).—The isolation of cholesterol (I) (as acetate and benzoate) from men's urine is described. In healthy men the amount of (I) excreted daily is approx. 0.75—1.0 mg. W. McC.

Sources of error in the determination of porphyrins in urine. C. TROPP and A. HOFMANN (Biochem. Z., 1937, 292, 74—81).—Spontaneous loss of porphyrins (I), favoured by duration of preservation, warmth, exposure to light, and adsorption on the Ca and Mg salts of the sediment deposited, occurs in urine on keeping. When the Et₂O extract of the

urine is washed with H₂O to remove AcOH, a loss of (I) inversely \propto the Et₂O vol. occurs. Losses are avoided by using fresh urine and an adequate vol. of Et₂O. W. McC.

Blood-sugar-raising substance in the urine of diabetic and non-diabetic patients. S. C. WERCH and S. S. ALTSHULER (Amer. J. Physiol., 1937, 118, 659—663).—The urine of diabetic patients contains a hyperglycaemic agent in amounts varying with the severity of the diabetes; non-diabetic urines contain none, or only traces. The agent is thermolabile and non-ultrafilterable, but is probably not a protein. It is sol. in H₂O and 60% EtOH, and is adsorbed by C and kaolin. R. N. C.

Salt economy in humid heat. C. DALY and D. B. DILL (Amer. J. Physiol., 1937, 118, 285—289).—The salt content of the sweat in moderate activity at moderate temp. is < under extreme laboratory and industrial conditions. Na and Cl fall after acclimatisation to humid heat has been established; K and N are not significantly altered. R. N. C.

Anæmia produced by milk diets in young, growing rats in testing the activity of liver preparations. H. J. WOLF and R. TSCHESCHE (Z. physiol. Chem., 1937, 248, 21—33; cf. this vol., 11).—In rats 3—4 weeks old, a diet consisting solely of goat's or cow's milk produces severe hypochromic anæmia. The erythrocyte and leucocyte [but not the hæmoglobin (I)] contents of the blood of such rats are increased by subcutaneous administration of liver preps., the min. active doses of which are thus determined. The erythrocyte, leucocyte, and (I) contents are also increased by giving minute amounts of Fe. W. McC.

Experiences with a concentrated whole liver extract. S. J. HARTFALL (Lancet, 1937, 233, 317—321).—Intramuscular injection of relatively small doses of a conc. liver extract (100 g. of whole liver yielding 1 c.c.) produced an adequate response in severe anæmia. The improvement obtained in cases of resistant hypochromic anæmia suggests a sp. stimulating effect of the prep. on the Fe metabolism. L. S. T.

Stable ferrous sulphate mixture for the treatment of nutritional anæmia in young children. H. M. M. MACKAY and L. E. JACOB (Lancet, 1937, 233, 570—572).—The effect of FeSO₄ on the hæmoglobin levels of Fe-deficient anæmic infants is recorded. L. S. T.

Comparison of oral administration versus intraperitoneal injection of colloidal iron on blood regeneration in nutritional anæmia of the rat. H. H. BEARD and T. S. BOGGESS (Amer. J. Physiol., 1937, 118, 211—216). R. N. C.

Biochemistry of the anæmias. I. Saponin anæmia and mineral constituents of the blood. G. STOLFI and C. BALDANZA. II. Tolylenediamine anæmia and carbohydrates. G. STOLFI and G. D'AROMA. III. Tolylenediamine and hæmorrhagic anæmias and mineral constituents of the blood. G. STOLFI and C. BALDANZA (Boll. Soc. ital. Biol. sperim., 1937, 12, 102—103, 172—173, 173—174).—I. Saponin anæmia increases [Cl'] of the blood,

plasma, and erythrocytes and $[Na^+]$ of the serum in rabbits. K^+ and Ca^{++} are variable whilst inorg. P is unchanged.

II. The anaemia (in rabbits) is accompanied by hyperglycaemia and diminution of liver-glycogen. Blood-glycolysis varies and, whilst the glucose consumed per unit vol. of blood decreases, that per erythrocyte increases.

III. Haemorrhagic anaemia in rabbits increases $[Cl^-]$ of whole blood, plasma, and corpuscles. Serum- Na , $-Ca$, and $-K$ are unchanged. With tolylenediamine anaemia, serum- Cl , $-K$, and $-Ca$ increase whilst serum- Na and plasma- and corpuscle- Cl are practically unchanged. F. O. H.

Production of cancer by pure hydrocarbons.

IV. W. E. BACHMANN, J. W. COOK, A. DANSI, C. G. M. DE WORMS, G. A. D. HASLEWOOD, C. L. HEWITT, and A. M. ROBINSON (Proc. Roy. Soc., 1937, B, 123, 343—368; cf. A., 1935, 774).—The carcinogenic action of a no. of hydrocarbons is examined. The high potency of methylcholanthrene was not exceeded by that of any other substance examined although cholanthrene closely approached it. The introduction of substituents into position 5 of the 1:2-benzanthrene (I) mol. is favourable to carcinogenic activity. 1:2:3:4-, 7-methyl-1:2:3:4-, and 3:4:8:9-dibenzpyrene have considerable potency in producing epitheliomas in mice. Among compounds unrelated to (I), 2-methyl-3:4-benzphenanthrene showed notable cancer-producing activity. A. G. P.

Aminoethyl phosphoric ester—a compound apparently specific to malignant tumours. E. L. OUTHOUSE (Biochem. J., 1937, 31, 1459—1463).—Aminoethyl phosphate (I), m.p. 244° (corr.) (cf. A., 1936, 364) (quinine salt), could not be detected in pancreas, liver, placenta, or embryo but is present in malignant tumours, the average amount being 36 mg. per 100 g. A synthesis of (I) is given and the solubility of the Ba salt determined in H_2O -EtOH and in H_2O -MeOH. P. W. C.

Permanent experimental diabetes produced by pituitary (anterior lobe) injections. F. G. YOUNG (Lancet, 1937, 233, 372—374).—Daily administration of an extract produced permanent diabetes in two dogs, temporary in a third. One dog treated with insulin required 60 units (4.4 units per kg.) to maintain the urine practically free from glucose on a normal, high-protein diet. L. S. T.

Effect of gangliectomy on mineral composition of bone. A. FERRANNINI (Pathologica, 1935, 27, 777—780).—In dogs lumbar gangliectomy decreased the total ash and Ca and increased the Mg and (slightly) the P contents of the bones of the posterior extremities. CH. ABS. (p)

Blood-catalase during experimental hyperthermia and fever in man. I. SOLAROLI (Arch. Fisiol., 1937, 37, 69—96).—During febrile conditions, the blood-catalase (I) increases rapidly with increase in body-temp. and suddenly diminishes as the temp. commences to return to normal vals. The level of (I), however, is not related to the temp. F. O. H.

Idiopathic steatorrhea. A. M. NUSSBRECHER and F. MORTON (Brit. Med. J., 1937, 1152—1154).—In an adult case there was no bone decalcification in spite of persistently low serum- Ca . Absorption of fat and carbohydrate was probably inefficient but that of protein was normal. Oedema associated with low serum-protein is discussed. A. G. P.

Pathogenesis of ketosis. Pregnancy disease of sheep. L. M. RODERICK, G. S. HARSHFIELD, and M. C. HAWN (J. Amer. Vet. Med. Assoc., 1937, 90, 41—50).—Glycogen (I) is withdrawn from the liver under conditions of an inadequate intake of carbohydrate and fat takes its place. (I) up to 9% is stored in the livers of foetal lambs and the demand in twin pregnancy is high. Fatty livers in ewes and lambs are produced by semi-starvation. Metabolism of carbohydrate is so reduced that fat oxidation cannot be carried beyond the stage of ketonic substances, these being formed in the liver. W. L. D.

Characteristic features of the milk of cows suffering from mastitis. E. PIJANOWSKI, J. SUPINSKA, and T. MATUSZEWSKI (Rocz. Nauk Roln. Leśn., 1937, 38, 1—34).—A negative correlation is established between the lactose and Cl^- , and a positive one between the catalase, leucocyte, and Cl^- , contents of milk from cows suffering from mastitis. The bromothymol-blue test for diagnosis of mastitis is less trustworthy than that depending on determination of Cl^- . Bacteriological data are presented. R. T.

Rennet test for detection of mastitis. F. B. HADLEY (J. Dairy Sci., 1936, 19, 165—169).—5 ml. of milk and 0.1 ml. of diluted rennet ($\times 50$) are kept at 22 — 28° for 1 hour. Samples which have not coagulated are abnormal. This simple test, compared with other tests for mastitis, gives results of equal significance. W. L. D.

Biochemical aspects of mental disorder. M. V. GOVINDASWAMY (Proc. Soc. Biol. Chem. India, 1937, 2, 11—16).—A lecture.

Chemistry of lipoidosis phosphatidica. P. H. TEUNISSEN (Z. physiol. Chem., 1937, 248, 142—150).—The accumulated lipins of the liver and spleen of a boy who suffered from Niemann-Pick disease consisted chiefly of lecithins and sphingomyelins. The liver had a greatly increased content of free cholesterol. The dried spleen of a person who suffered from Gaucher's disease contained 14% of kersasin. The lipin content of the organs is not affected by preservation for years in aq. CH_2O . W. McC.

Lipinaemia following abortion. E. M. BOYD (Endocrinol., 1937, 21, 292—294).—Incomplete abortion in women was associated with increased plasma-lipin as compared with those in the corresponding period of normal gestation. There was no change in the lipin content of the red cells. J. L. C.

Filterable calcium in late-pregnant and parturient women and in the new-born. M. ANDERSON and F. W. OBERST (J. Clin. Invest., 1936, 15, 131—133).—Average vals. for filterable serum- Ca in non-pregnant, late-pregnant, and parturient women

and in the new-born are const. Reported variations are due primarily to changes in total Ca.

CH. ABS. (p)

Hypoadrenalism and pellagra: rôle of vitamin deficiency. I. M. SOLARE (Brit. Med. J., 1937, 1249—1251).—The sp. val. of vitamin- B_3 in pellagra is questioned. A case of pellagra as a terminal manifestation of hypoadrenalism is cited. Functional hypoadrenalism, pellagra, and secondary pellagra probably have common ætiological factors. Relations between vitamin-C and the adrenal cortex are discussed.

A. G. P.

Effect of iodine and inorganic and organic iodo-compounds on osseous lesions of experimental rickets. R. LECOQ (Compt. rend., 1937, 204, 1891—1893).—Addition to the diet of 0.5% of I, 0.75% of KI, 2% of "iodocalcioformin," or 1% of iodinated oil of carnations cures rickets induced in young rats by a rachitogenic diet. Expressed as I, 0.4—0.5% is necessary in an antirachitic diet.

J. L. D.

Variation in blood-uric acid during scarlatina. E. DICKER (Compt. rend. Soc. Biol., 1937, 125, 1048—1049).—Blood-uric acid increased until the 25th day and then slowly decreased.

H. G. R.

Effect of the plane of nutrition on the course of animal trypanosomiasis. M. H. FRENCH and H. E. HORNBY (Ann. Rept. Dept. Vet. Sci. Tanganyika, 1934, 40—56).—The course of *T. congolense* disease is unaffected by planes of nutrition > those of maintenance.

CH. ABS. (p)

Sodium chloride content of cerebrospinal fluid in tuberculous meningitis. J. INGHAM (Brit. Med. J., 1937, No. 3993, 111—113).—The NaCl content (determination described) of spinal fluid in cases of tuberculous meningitis is rarely > 600 mg. per 100 c.c. Vals. < 550 mg. are found only in such cases.

A. G. P.

Alkalosis with disordered kidney functions. R. A. McCANCE and E. M. WIDDOWSON (Lancet, 1937, 233, 247—249).—A case report. The main cause of the uræmic state was probably a fall in glomerular filtration as referred to inulin. Other changes in clearances such as those of creatinine, urea, and K⁺ are discussed. No increase in total serum-base or -Ca, and only a small increase in serum-Mg, was observed.

L. S. T.

Mechanism of experimental uræmia. M. F. MASON, H. RESNIK, jun., A. S. MINOT, J. RAINEY, C. PILCHER, and T. R. HARRISON (Arch. Int. Med., 1937, 60, 312—336).—Retention of substances antagonistic to Ca⁺⁺ in the cerebrospinal fluid, phenols, guanidine, and urea together with a disturbance of the acid-base balance were observed.

H. G. R.

Proteolytic activity of the sera of dogs with experimental uræmia. M. F. MASON and R. EYERS (J. Biol. Chem., 1937, 119, 735—739).—Serum from uræmic dogs has a greater proteolytic action on normal dog's fibrin than serum from normal dogs.

J. L. C.

Extreme degree of leucocytosis in whooping-cough. W. J. PEARSON and G. H. NEWNS (Lancet, 1937, 233, 254—255).—A case with unusually high

leucocyte count and a relative increase in the lymphocytes is reported.

L. S. T.

Application of affinity to coupled biochemical reactions.—See A., I, 468.

Standard metabolism in the white mouse. H. G. BARBOUR and J. TRACE (Amer. J. Physiol., 1937, 118, 77—86).

R. N. C.

Tissue metabolism under the influence of (A) low oxygen tensions, (B) carbon monoxide. H. LASER (Biochem. J., 1937, 31, 1671—1676, 1677—1682).—(A) The respiration of retina, chorion, allantois, liver, and tumour at 5—20% O₂ tension equals (excepting with liver) that at 100%, whilst the aerobic glycolysis is significantly increased and the R.Q. lowered. The effects are due to changes in enzymic activity.

(B) The respiration of the tissues in O₂-CO equals that in O₂-N₂ mixtures. Replacement of N₂ by CO, however, increases aerobic glycolysis, thus indicating inhibition of the Pasteur effect, an inhibition totally or partly reversed by exposure to light.

F. O. H.

Respiratory quotient of renal tissue of Houssay dogs. J. F. FAZEKAS, E. H. CAMPBELL, jun., and H. E. HIMWICH (Amer. J. Physiol., 1937, 118, 297—299).—Lactate is oxidised, but not glucose.

R. N. C.

Direct determination of the renal blood flow and renal oxygen consumption of the unanæsthetised dog. M. F. MASON, A. BLALOCK, and T. R. HARRISON (Amer. J. Physiol., 1937, 118, 667—676).

R. N. C.

Simultaneous measurement of renal blood flow and excretion of hippuran and phenol-red by the kidney. K. A. ELSOM, P. A. BOTT, and A. M. WALKER (Amer. J. Physiol., 1937, 118, 739—742).

R. N. C.

Basal metabolism and urinary nitrogen excretion of Chinese, Manchus, and others of the Mongolian race. F. G. BENEDICT, L. C. KUNG, and S. D. WILSON (Chinese J. Physiol., 1937, 12, 67—100).—High pulse and respiration rates generally coincided with a high metabolic level. The urinary N excretion per kg. of body-wt. was essentially the same as for Caucasians, and was the lower the older was the subject. The basal metabolism of the Chinese, taken as a whole, is < that of the Caucasian.

J. N. A.

Creatinine, blood-sugar, and basal metabolism of soldiers. A. DE NIEDERHÄUSERN (Boll. Soc. ital. Biol. sperim., 1937, 12, 88—90).—Tabulated data show that residence in the tropics has no effect on endogenous N balance or carbohydrate equilibrium.

F. O. H.

Basal metabolism of women over 35 years of age. H. MCKAY and M. B. PATTON (53rd Ann. Rept. Ohio Agric. Exp. Sta. Bull., 1935, No. 548, 82).—The basal metabolic rate per unit wt. or surface area remains fairly uniform from 35 to 50 years and subsequently declines.

CH. ABS. (p)

Effect of temperature, humidity, and other factors on the hatch of hen's eggs and on energy metabolism of chick embryos. H. G. BAROTT

(U.S. Dept. Agric. Tech. Bull., 1937, No. 553, 45 pp.).—In the range 35.5–39.8° the energy metabolism and speed of hatching increased with rise of temp. Max. hatching occurred at 37.8° and the ill effects of temp. rise increased with deviations on either side of this optimum. Optimum hatching at 38.9° was observed with R.H. 58, and at 37.8° with R.H. 61%, the nos. hatching decreasing more and more rapidly as the R.H. deviated from the optimum. During the second half of the incubation period the energy metabolism was max. with optimum R.H. The metabolic rate and the no. of eggs hatching diminished with increasing $[\text{CO}_2]$ (0.5–4.0%) in the incubator air. CO_2 allowed to accumulate gradually during incubation was less injurious than when maintained at an intermediate level throughout. The optimum $[\text{O}_2]$ for hatching was 21%; an increase in concn. was less harmful than a decrease of similar magnitude. The R.Q. and thermal quotient indicated a carbohydrate metabolism during the first few days of incubation and an almost exclusively fat and protein metabolism after the tenth day. A. G. P.

Effect of ketogenic diet on the blood-sugar and respiratory quotient of children. F. B. TALBOT and V. BATES (Amer. J. Dis. Children, 1935, 50, 827–839).—The R.Q. of children is lowered < that of adults by a ketogenic diet. Blood-sugar diminishes but the basal heat production is unaffected.

CH. ABS. (p)

Coagulation defect in sweet clover disease and in the hæmorrhagic chick disease of dietary origin: source of prothrombin. A. J. QUICK (Amer. J. Physiol., 1937, 118, 260–271).—Rabbits fed with spoiled sweet clover hay show a fall in plasma-prothrombin (I) which runs parallel with the hæmorrhagic tendency. (I) is raised temporarily by injection of citrated blood, but scarcely at all by defibrinated blood. Addition of 5% of lucerne (II) to the diet raises (I) to a level of safety. Chicks fed on a diet deficient in vitamin-K show a gradual fall of (I), which is restored to normal by (II). Sweet clover hay is considered to contain a principle that destroys (I), whilst (II) contains a factor promoting (I) synthesis, which is not identical with -K but may be related to it. A method for determination of (I) is described. R. N. C.

Dietary factors influencing cardiac rigor in albino rats. S. CHANG, M. C. PATRAS, and R. D. TEMPLETON (Amer. J. Physiol., 1937, 118, 423–430). R. N. C.

Effect of a lysine-deficient diet on the œstrous cycle. P. B. PEARSON (Amer. J. Physiol., 1937, 118, 786–791).—In the rat *d*-lysine restores the œstrous cycle which has ceased as a result of a diet containing gliadin as protein. R. N. C.

Relation of dietary protein to sterility. I. J. CUNNINGHAM, C. S. M. HOPKIRK, and M. M. CUNNINGHAM (New Zealand J. Sci. Tech., 1937, 19, 22–30).—An otherwise complete diet but with maize and oats as protein source caused good growth in rats but atrophy and non-functioning of the testes. Wheat-, rye-, and barley-protein gave normal development of

the testes. Small additions of animal protein and yeast to the maize rations prevent degeneration.

W. L. D.

Effect of diet on the survival of adrenalectomised rats. H. G. SWANN (Amer. J. Physiol., 1937, 118, 798–805). R. N. C.

Duration of the digestion of different foods in the digestive tract of the dog. J. ROOS and S. KOOPMANS (Arch. Néerland. Physiol., 1937, 22, 52–71).—The time of passage of the food through the gastro-intestinal tract was determined by ascertaining when potato-starch grains added to the diet appeared in the rectum. A flesh diet required a somewhat shorter time for passage than a mixed or brown bread diet if no liquid was given; when liquid was administered simultaneously, there was little difference in the times of passage. W. O. K.

Specific dynamic action of butter-fat and of superimposed sugar. J. R. MURLIN, A. C. BURTON, and W. M. BARROWS, jun. (J. Nutrition, 1936, 12, 613–644).—The average sp. dynamic action observed in human subjects was 4.74% of the fat-calories fed. The val. was unrelated to age but was influenced by the tolerance for (capacity to digest and to metabolise) fat. Feeding glucose or sucrose in addition to the high-fat meal produced two types of dynamic response, (a) quant. addition to the fat metabolism, (b) an increase > that due to feeding the same amount of sugar alone, and ascribed to additional fat metabolism. Part of the extra heat produced may result from ketone oxidation induced by the sugar (see following abstract). The sp. dynamic action of fat is not paralleled by blood-fat. A. G. P.

Rate of ketogenesis in human subjects on high-fat diets, as influenced by different sugars. J. R. MURLIN, E. S. NASSETT, W. R. MURLIN, and R. S. MANLY (J. Nutrition, 1936, 12, 645–670).—Addition of sucrose, fructose, or glucose to a high-fat diet reduced ketosis, the relative efficiency of the sugars varying with the dosage level. In no case was ketogenesis completely extinguished although the increase in carbohydrate was > sufficient according to Shaffer's theory. Sugar administered 3–5 hr. after the fat was less effective than when given 11–15 hr. after, and caused a smaller increase in carbohydrate combustion. This is attributed to replenishment of liver-glycogen (I) following stimulated production of insulin. Formation of (I) is as important as combustion in the antiketogenic action of sugars. A. G. P.

Relative participation of proteins and fats in covering the energy during inanition. S. SYNEPHIAS (Bull. Soc. Chim. biol., 1937, 19, 1037–1058).—The relative amounts of protein and fat utilised to supply energy requirements during starvation and after removal of glycogen stores vary considerably with the species, the proportion from protein being for the dog, rat, and guinea-pig 10%, for the pig 6%, for the rabbit 30%, and for man 15–20%.

P. W. C.

Nutrition of Black Sea fishes. L. V. ARNOLDI and K. R. FORTUNATOVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 513–516).—The wt. curves and the food consumption and assimilation of various

fishes have been determined under aquarium conditions. W. O. K.

Biological value of the proteins of soya bean, field pea, and *Lathyrus sativa* by the balance-sheet and growth methods. K. P. BASU and M. C. NATH (Indian J. Med. Res., 1937, 24, 1001—1026).—The biological vals. of soya-bean proteins by the balance-sheet method at 5, 10, and 15% levels of protein in the diet are 64, 58, and 54% and those of the cooked product are 52, 50, and 47%, respectively. The vals. for field pea and *L. sativa* proteins at 10 and 15% levels are 48, 41, and 50, 44%, respectively. The high biological val. of the soya-bean proteins is confirmed by results obtained by the rat growth method. W. O. K.

Effect of feeding dogs with vegetable "proto-acid." I. LEONTEV (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 13—17; cf. A., 1936, 1143).—Replacement of protein by "proto-acids" of peas in the diet of young dogs did not affect the gain in wt. or the blood analysis nor produce evidence of rickets. CH. ABS. (p)

Digestion of milk and of modified milk (A) *in vitro*; (B) *in vivo*. D. FETTER and F. W. SCHULTZ (Amer. J. Dis. Children, 1935, 50, 1101—1106, 1107—1112).—(A) Untreated milk, lactic acid milk, evaporated and powdered milks are rapidly and completely digested at p_H 4.5 by artificial gastric juice which contains rennin (I). In the absence of (I) digestion occurs only at p_H 1.8—3.0.

(B) The time required to produce the max. concn. of sol. N in the gastric contents after ingestion of various forms of milk was greatest (1.5 hr.) in the case of untreated milk. CH. ABS. (p)

Semi-synthetic diet for *Helix pomatia*. N. H. HOWES [with R. B. WHELLOCK] (Biochem. J., 1937, 31, 1489—1498).—For investigation of the dietetics of *H. pomatia* the young snails soon after hatching are supplied with a semi-synthetic diet containing purified caseinogen, pure carbohydrate, an artificial salt mixture, leaf extract or cod-liver oil, and commercial cholesterol. Growth is almost as rapid as with control animals. Snails require vitamin-A or carotene, some or all of the constituents of the -B complex, but not chlorophyll. The requirement in respect to -D and cholesterol is not clearly defined. P. W. C.

Fate of racemic amino-acids in the animal organism. E. ABDERHALDEN and H. HANSON (Fermentforsch., 1937, 15, 274—284; cf. A., 1935, 654).—*L*-Histidine (I), fed to rabbits, is completely degraded but *D*-histidine (II) is scarcely affected. In pigeons, (II) does not produce disease when injected and after parenteral administration of (I) and (II) no histamine is found in the serum or plasma. W. McC.

Metabolism of amino-acids in heart- and lung-tissues. K. P. BASU and M. N. BASAK (Indian J. Med. Res., 1937, 24, 1117—1124).—Of various NH_2 -acids tried, only *L*-cystine (I) and *L*-proline (II) undergo oxidative deamination in presence of thin slices of heart-tissue (rat), whilst the lung-tissue deaminates only (I). The deamination of (I) in both tissues is

not affected by KCN or octyl alcohol (III), but the deamination of (II) by heart tissue is completely inhibited by KCN and partly by (III). W. O. K.

Creatine and creatinine metabolism. IV. Creatinine and creatine from ox-serum. V. Origin of urinary creatinine. M. K. ZACHERL (Z. physiol. Chem., 1937, 248, 69—79, 80—84; cf. A., 1935, 654; Behre and Benedict, A., 1936, 1013; Goudsmit, *ibid.*, 1544).—IV. The serum contains pre-formed creatinine (I), isolated by deproteinising successively with EtOH and basic Pb acetate and pptg. with $HgCl_2$. After removal of (I) creatine is converted into (I) and so isolated.

V. In dogs and rabbits the (I) content of the renal vein is < that of the renal artery. (I) of the urine is probably derived from the blood. W. McC.

Fate of guanidinoglyoxaline in the animal body. M. MOHR (Z. physiol. Chem., 1937, 248, 57—64; cf. Hunter, A., 1936, 999).—When 4(or 5)-guanidinoglyoxaline (I) (*dipicrate*, m.p. 210—211° (uncorr.); *aurichloride*, m.p. >365°; *flavianate*), glyoxaline (II), and carnosine (III) are administered to dogs, the proportions recovered in the urine are 33, 7.6, and 0%, respectively. (III) is probably degraded chiefly to urea. (I) slightly increases the sugar content of the blood and temporarily diminishes its pressure. Equimol. mixtures of guanidine and (II) also diminish blood-pressure. No (I) is found in dog's urine following administration of guanine. The lethal doses of (I) for the mouse and dog are 0.15—1.0 g. and 40—50 mg. per kg., respectively. W. McC.

Amino-acid metabolism. III. Fate of *dl*-leucine, -norleucine, and -isoleucine in the normal animal. J. S. BUTTS, H. BLUNDEN, and M. S. DUNN (J. Biol. Chem., 1937, 120, 289—295; cf. this vol., 304).—*dl*-Leucine fed to rats did not give rise to glycogen (I), but formed ketonic substances which consisted of 65% of β -hydroxybutyric acid, 35% of $COMe_2$, and $CH_2Ac \cdot CO_2Et$. *dl*-Norleucine produced (I) and exhibited marked ketolytic properties. *dl*-isoleucine formed a small amount of (I) and under certain conditions gave rise to ketonic substances. Possible mechanisms are discussed. J. N. A.

Production of taurocholic acid in the dog. R. W. VIRTUE and M. E. DOSTER-VIRTUE (J. Biol. Chem., 1937, 119, 697—705).—Administration of cystine or methionine [but not alanine or homocystine (I)] together with cholic acid to fasting dogs with biliary fistulae which had received cholic acid for several days increased the output of taurocholic acid in the bile. Most of the S of (I) was excreted in the urine as inorg. SO_4 . J. L. C.

Choline and its derivatives. VI. Presence of choline in biological substances. Choline of sperms. VII. Action of leech and frog muscle on quaternary ammonium compounds with an ester grouping. E. KAHANE and J. LÉVY (Bull. Soc. Chim. biol., 1937, 19, 959—975, 976—989).—VI. Free choline (I) is not present in sperms at the time of emission but arises subsequently under the action of an enzyme (secreted by the prostate) which

reacts with a substrate (not acetylcholine or lecithin) present in the spermatic secretion.

VII. The action of esters of (I) with HCO_2H , AcOH , EtCO_2H , BzOH , HBr , and HNO_3 , of β -methylcholine with AcOH , and of the Et ester of betaine is greater with eserised than with normal muscle of leech and frog, whereas with (I) carbamate there is no difference. The sensitivity to eserine runs parallel with the ability of the muscle pulp to hydrolyse these esters (cf. A., 1936, 875, 895, 1140). P. W. C.

Importance of cystine for the growth of fur of rabbits. A. I. DERAVLEV (Sherstjanol Delo, 1935, No. 4—5, 14—17).—Addition of cystine but not that of S to the diet increased the wt. and improved the quality of the fur. CH. ABS. (p)

Nitrogen: sulphur ratio of the whole organism of rats fed with cystine. E. LIPPMANN and U. DACHA (Boll. Soc. ital. Biol. sperim., 1937, 12, 195—197).—Administration of *l*-cystine increases the balance of S but not of N. Part of the increase in S balance cannot be accounted for and is possibly due to S metabolism of intestinal bacteria. F. O. H.

Metabolism of sulphur. VI. Oxidation in the body of the sulphur-containing amino-acids and some of their partially oxidised derivatives. G. MEDES (Biochem. J., 1937, 31, 1330—1346).—The rate of excretion and degree of oxidation of the S of a large no. of S-containing NH_2 -acids and oxidised derivatives by a normal individual under standardised conditions are determined. The S of cysteine (I) and methionine was recovered in the urine as inorg. SO_4^{2-} almost quantitatively within 16 hr. The rate of oxidation of cystine (II) was greatest when fed as the Li salt but was even then \ll of (I). The rate of oxidation to SO_4^{2-} followed the order (I) > (II) > cystine disulphoxide > cysteinesulphinic acid > cysteic acid, and this series cannot represent the path of oxidation to SO_4^{2-} . Recovery of total S also decreased in the same order, suggesting that the S of the more highly oxidised members is more available for synthetic processes. The S of α -hydroxy- γ -methylthiolbutyric acid (hydroxymethionine) was recovered within 24 hr. to the extent of 95%, of which 83% was as inorg. SO_4^{2-} , whereas that of α -dihydroxy- γ -dithiodipropionic acid (hydroxycystine) was only 25% recovered, of which 39% was as SO_4^{2-} . All S of $\text{CS}(\text{NH}_2)_2$ was excreted in 48 hr., 92% in org. form. P. W. C.

α -Guanidoglutaric acid, a possible precursor of creatine.—See A., II, 403.

Metabolism of purine-nitrogen in fish and batrachia. II. Catabolism of purine-nitrogen in Teleostei. A. BRUNEL (Bull. Soc. Chim. biol., 1937, 19, 1027—1036).—With a no. of Teleostei (*Esox*, *Cyprinus*, *Leuciscus*, *Scomber*, etc.) uric acid, allantoin, and allantoic acid are converted enzymically into urea, the liver containing uricase, allantoinase, and allantoicase (I) (cf. this vol., 344). With another group (*Salmo*, *Gadus*, *Conger*, *Anguilla*, etc.), (I) is absent and purine-N is degraded only to allantoic acid and not to urea. P. W. C.

Synthesis of uric acid in the organism of the bird. IV. Xanthine synthesis. W. REINDEL
Y** (A., III.)

and W. SCHULER (Z. physiol. Chem., 1937, 248, 197—204).—Xanthine (I) is obtained from NH_2 -acids as source of N and an unknown source of C in presence of pigeon liver. Adenine and hypoxanthine are not intermediate steps in the syntheses of (I). H. W.

Degradation of histidine by ascorbic acid and thioglycollic acid. P. HOLTZ and G. TRIEM (Z. physiol. Chem., 1937, 248, 5—20; cf. A., 1937, II, 117; Edlbacher *et al.*, A., 1934, 920).—In presence of O_2 , ascorbic acid and thioglycollic acid break the glyoxaline (I) ring of histidine (II), giving 1 mol. of NH_3 and a labile intermediate from which a second mol. of NH_3 is liberated by aq. NaOH. In acid media, the extent of degradation is such that twice as much NH_3 is subsequently liberated by aq. NaOH as by aq. Na_2CO_3 , the mechanism of the breakdown being the same as with liver-histidase. In neutral and alkaline media, the amount of NH_3 liberated by aq. Na_2CO_3 is > 50% of that liberated by aq. NaOH. H_2O_2 , O_3 , and ultra-violet light liberate 2 N from (II) as NH_3 with production of a substance from which the third N is liberated by aq. NaOH. Isatin deaminates the side-chain of (II) but does not break the (I) ring. The mechanism of the reactions is discussed. W. McC.

Intermediary metabolism of tryptophan. XXVII. Change of configuration of *d*-tryptophan in the animal body. Y. KOTAKE and S. GOTO [with T. HAMADA, K. TANAKA and Y. KOTAKE, jun.] (Z. physiol. Chem., 1937, 248, 41—56; cf. A., 1936, 1544).—*l*-Tryptophan (I), after bacterial conversion into indole, is colorimetrically determined by treatment with $p\text{-NMe}_2\cdot\text{C}_6\text{H}_4\cdot\text{CHO}$ using a step photometer. Slices and (more vigorously) pulp of kidney and (especially) liver of rats and (less vigorously) mice convert *d*- into *l*-(I). Organs of some other animals act in the same way. Indolyl-pyruvic (II) and *l*(+)- [but not *d*(-)]-indolyl-lactic acid are converted by kidney into *l*-(I). In rats (but not in mice and rabbits), *d*-(I) has an anti-anæmic action equal to that of *l*-(I). The conversion of *d*- into *l*-(I) proceeds by way of (II). W. McC.

Xanthurenic acid. IV. Formation *in vivo* of xanthurenic acid from tryptophan. L. MUSAJO and F. M. CHIANCONE. VII. Chromatographic isolation of urinary indirubin. L. MUSAJO (Gazzetta, 1937, 67, 218—222, 235—238; cf. A., 1937, II, 305).—IV. The urine of guinea-pigs or rabbits fed with a sufficient amount of tryptophan (I) contains xanthurenic acid (II). When (I) is injected subcutaneously into rabbits, (II) is also excreted, with kynurenine. In no case does the administration of kynurenine acid (III) lead to excretion of (II); (III) thus cannot be an intermediate in the formation of (II) from (I) *in vivo*. Dogs fed on (II) do not excrete (III).

VII. The urine of rats or rabbits fed on a fibrin diet gives a red PhMe extract, from which the red substance is not adsorbed by sugar or CaCO_3 . There is some adsorption on $\text{Ca}(\text{OH})_2$, but the best result is obtained with active Al_2O_3 , which by chromatographic adsorption gives a zone containing indirubin, and another with traces of indigo. E. W. W.

Formation of tyramine by animal tissue. P. HOLTZ (Naturwiss., 1937, 25, 457).—Kidney tissue of rabbits or guinea-pigs or extracts of these tissues made with PO_4''' solutions convert tyrosine into tyramine. Muscle-, liver-, and pancreas-tissue give negative results. These findings have a bearing on the etiology of essential hypertension. W. O. K.

Deamination of glycine by "omega" [catalyst]. E. ABDERHALDEN and E. BAERTICH (Fermentforsch., 1937, 15, 342—347; cf. Kisch, A., 1931, 1088).—The change produced in glycine when adrenaline (I) is added is due not to (I) itself but to the oxidation product "omega." CH_2O and (probably) glyoxylic acid are produced in addition to NH_3 . W. McC.

Absorption of lipins. I. Oleic acid in normal dogs. II. Oleic acid in phloridzinised dogs. S. FILIPPON and L. BELLINI (Boll. Soc. ital. Biol. sperim., 1937, 12, 135—136, 136—137).—I. Oleic acid (1 c.c.), introduced into the Vella fistula of a dog, is absorbed to the extent of 45%.

II. The absorption is at first greatly diminished but after continuous injection of phloridzin returns to normal vals. F. O. H.

Chemical relationships of blood-cholesterol: cholesterol metabolism. L. M. HURXTHAL and H. M. HUNT (Ann. Intern. Med., 1935, 9, 717—727).—High-fat diets of exclusively animal foods increase blood-cholesterol (I) and may be a factor in arteriosclerosis. Hypocholesterolaemia is common in xanthosis. Hyperthyroidism diminishes and hypothyroidism increases (I), which is also low in hypopituitarism and high if there are cholesterol deposits in the body. CH. ABS. (p)

Alimentary disturbance produced by fatty acids and soaps. R. LECOQ (J. Pharm. Chim., 1937, [viii], 26, 56—62).—22% of castor oil (I) in a diet fed to pigeons causes no inconvenience (cf. A., 1936, 904). When the fatty acids of (I) alone, or with glycerol (II), or as their K salts are fed in corresponding amounts, the birds die of polyneuritis even when 3 g. of dried yeast are fed daily. Similar experiments with the fatty acids from olive oil and with a mixture of stearic, palmitic, and oleic acid (5:4:1) show that the addition of (II) or the use of the K salts provides some protection against polyneuritis. J. L. D.

Liver function as tested by the lipæmic curve after intravenous fat administration. A. NACHLAS, G. L. DUFF, A. C. TIDWELL, and L. E. HOLT, jun. (J. Clin. Invest., 1936, 15, 143—151).—Administration of CCl_4 to dogs causes difficulty in removing fat from blood after intravenous injection, probably because of liver damage. The lipæmic curve after fat injection may serve in examinations of liver function. CH. ABS. (p)

[Biological] dehydrogenation of the cyclohexane ring. K. BERNHARD (Z. physiol. Chem., 1937, 248, 256—276).—In dogs, *o*-, *m*-, and *p*-toluic acid, hexahydrobenzoyl derivatives of sarcosine and alanine, hexahydro-*o*-toluic acid (*cis*- and *trans*-), and 1:1:3:4:6-tetrahydroxyhexahydrobenzoic acid pass through the organism unchanged and the OH -, Me -, Me_2 -, and NH_2 -derivatives of cyclohexane are

retained or destroyed. Hexahydrobenzoic acid and the *N*-Me and -Me_2 derivatives of its amide, hexahydrohippuric acid, and cyclohexylpropionic acid are converted into BzOH and/or hippuric acid but cyclohexylacetic acid is converted chiefly into succinic acid, no $\text{CH}_2\text{Ph}\cdot\text{CO}_2\text{H}$ being found in the urine. Hexahydro-*m*-toluic acid is converted into *m*-toluic acid whilst the corresponding *p*-acid is partly dehydrogenated. It follows that appreciable dehydrogenation of the cyclohexane ring in the dog occurs only when the ring contains CO_2H or a group readily converted into CO_2H and that the presence of *o*-Me prevents the dehydrogenation. W. McC.

Carbohydrate metabolism during experimental human salt deficiency. R. A. McCANCE (Biochem. J., 1937, 31, 1276—1277).—Experimental salt deficiency produced by diet and sweating gave an increase over normal vals. for blood-sugar in fasting subjects and 2 hr. after ingestion of 50 g. of glucose. J. L. C.

Variation in the glycogen content of edible oysters. H. BERRY, B. GOUZON, and C. MAGNAN (Compt. rend., 1937, 204, 1895—1897).—The glycogen (I) content of the liver and pancreas and of the genitalia of *Ostrea edulis* and *Gryphea angulata* is a max. in December and remains at a high level for several weeks. The adductor muscles and mantle are low in (I). The actual (I) content varies considerably from species to species. J. L. D.

Biochemistry of carbohydrates. XXV. Detoxication of ingested naphthalene and excretion of [conjugate with] uronic acid. H. MASAMUNE (J. Biochem. Japan, 1937, 25, 299—305).—The urine from rabbits fed with C_{10}H_8 yielded in one case α -naphtholglycuronic acid and in all others a substance (I), $\text{C}_{15}\text{H}_{16}\text{O}_7\cdot\text{H}_2\text{O}$, m.p. 154—156° (Ac_3 derivative, m.p. 145°), hydrolysed ($\text{N-H}_2\text{SO}_4$) to $\alpha\text{-C}_{10}\text{H}_7\text{OH}$ and a pentaauronic acid [phenylosazone, m.p. 120—122° (decomp.) (*Ba* salt, m.p. 211°)]. No conjugate of $\beta\text{-C}_{10}\text{H}_7\text{OH}$ was detected. (I) was hydrolysed by emulsin. F. O. H.

Pancreatectomy in the pig. F. D. W. LUKENS (Amer. J. Physiol., 1937, 118, 321—327).—The fasting glucose excretion after pancreatectomy is very slight or non-existent, and the fasting N excretion is low. Ingested carbohydrate is excreted quantitatively. There is a marked ketonuria, but no accompanying severe acidosis. Pituitary extracts cause acidosis and increase serum-lipins. R. N. C.

Hexose diphosphate metabolism of normal tissue extracts. C. A. MAWSON (Biochem. J., 1937, 31, 1657—1670).—Dialysed extracts of blood, brain, kidney, liver, muscle, spleen, and testis of mice and rats, in presence or absence of glutathione (I) and at 38° or 50—55°, do not convert glucose into lactic acid (II) but, with the exception of blood, form small amounts of (II) from hexose diphosphate (III) at 50—55°, especially in presence of (I); at 38°, the action is slight and not influenced by (I). (I) is effective at concns. $>0.0027\%$. The action on (III) at 50—55° is increased by dilution of the extract. Rapid formation of alkali-labile PO_4 esters from (III) occurs in liver extract at 52° in presence of citrate or HCO_3' .

buffer; this formation and the amount of inorg. $\text{PO}_4^{'''}$ produced are unaffected by (I), whilst in absence of (I) AcCHO is not produced. With tissue extracts heated at 51° for 30 min., the enzymic activity remains in the uncoagulated portion. (I) cannot be replaced by cysteine. The mechanism of the above reactions is discussed.

F. O. H.

Effects of glucose, fructose, and galactose on ketosis produced by anterior pituitary extract and by pancreatectomy. D. E. CLARK and J. R. MURLIN (J. Nutrition, 1936, 12, 469—490).—In dogs with ketosis due to prolonged high-fat diet and injection of anterior pituitary extract, the ketolytic action and also the N-sparing effect of galactose (I), fructose (II), and glucose (III) decreased in the order named. In depancreatized dogs (I) and (III) had approx. the same ketolytic effect. (II) showed no action within 8 hr. of ingestion. The N-sparing action of (II) and (III) was $>$ that of (I).

A. G. P.

Comparative effects of glucose, sucrose, and fructose on ketone production in phloridzinized dogs. W. R. MURLIN and R. S. MANLY (J. Nutrition, 1936, 12, 491—508).—With large doses (50 g.) the ketolytic action of glucose (I) is $>$ that of sucrose in phloridzinized dogs. With 15 g. doses the effect of (I) is $>$ and with 25 g. doses = that of fructose. The N-sparing effect and the ketolytic action of the sugars are not parallel. Ketolytic action is preferably based on measurements of "ketone production," a combination of ketonuria and ketonæmia. Suitable formulæ are given.

A. G. P.

Ketosis. XII. Effect of choline on ketonuria of fasting rats following a high-fat diet. H. J. DEUEL, jun., S. MURRAY, L. F. HALLMAN, and D. B. TYLER (J. Biol. Chem., 1937, 120, 277—288; cf. this vol., 306).—Administration of choline (I) to rats on a high butter-fat diet prevents accumulation of fat in the liver; during subsequent fasting, there is considerable infiltration of fat into the liver. The ketonuria level is lower during the first 2 fast days and higher during the next 3 days in rats previously fed the (I)-butter-fat diet than in the controls. Administration of (I) during fasting to rats which had had only the butter-fat diet did not alter the ketonuria during the first 3 days, but lowered it significantly in the males on the 4th and 5th days. The liver-fat also decreased more rapidly in rats which received (I) during the fast. Addition of (I) during inanition period to the diet of rats previously receiving (I)-butter-fat diet significantly lowered the ketonuria, and also prevented infiltration of fat into the liver. Hence (I) does not increase rate of fat oxidation; it prevents deposition of labile fat in the liver but cannot prevent deposition in tissues.

J. N. A.

Antiketogenic action of glucose in the absence of insulin. I. A. MIRSKEY, J. D. HEIMAN, and R. H. BROH-KAHN (Amer. J. Physiol., 1937, 118, 290—296).—Intravenous injection of glucose in large amounts in depancreatized dogs results in removal of blood-ketones (I); previous nephrectomy or phloridzinisation does not alter the effect, which is considered to be due to deposition of glycogen in the liver.

Blood-sugar (II) in the fasted depancreatized dog is depressed, and (I) increased, by phloridzin; (I) is inversely \propto (II). The degree of ketonuria gives no indication of the (I) content, although it changes with it. The metabolic disturbance in pancreatic diabetes is probably due to an alteration in the balance between glycogen storage and glycogenolysis; the associated production of (I) is then due to compensatory acceleration in the catabolism of fatty acids and proteins in the liver.

R. N. C.

Ionic reaction and anaerobic metabolism of isolated muscle. R. LIPPMANN and J. WAJZER (Bull. Soc. Chim. biol., 1937, 19, 1019—1026).—Using pairs of muscles, with and without $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$, the decomp. of glycogen, creatinephosphoric acid, adenosinetriphosphoric acid, hexose monophosphate, etc. and the formation of lactic acid are investigated at various p_{H} . The results do not agree with those of Lipmann and Meyerhof (A., 1931, 117) and are discussed in respect to those of other workers.

P. W. C.

Carbohydrate and phosphorus changes in prolonged muscular contractions. J. SACKS, W. C. SACKS, and J. R. SHAW (Amer. J. Physiol., 1937, 118, 232—240).—Prolonged stimulation *in situ* of the muscles of cats at the rate of 1 twitch per sec. causes no formation of hexose phosphate (I) or hydrolysis of adenosine triphosphate (II). At a rate of 2 twitches per sec., (I) appears and (II) is hydrolysed before and after the "steady state" is reached, whilst formation of lactic acid (III) in the first min. is >3 times as much as at the lower rate. Creatine phosphate is hydrolysed as (III) accumulates, and is resynthesised as (III) disappears. During the steady state, (I) that has previously accumulated in the muscle tends to disappear, and (III) is formed continuously in small amount, the rate of formation depending on the intensity of activity of the muscle. H_2O is absorbed in large amounts from the blood stream by the working muscle.

R. N. C.

Internal exchange in glandular tissues. A. M. UTEVSKI, E. I. KOVTUN, and K. M. SCHLEIFER (Med. Exp. Ukraine, 1934, No. 1, 32—37).—Glycolysis in glandular tissue differs from that in muscle. Glucose is a better generator of lactic acid (I) than is glycogen. Formation of (I) is favoured by the presence of pyro-tartrates or alanine.

CH. ABS. (p)

Blood- and muscle-lactic acid in the steady state. J. SACKS and W. C. SACKS (Amer. J. Physiol., 1937, 118, 697—702).—Lactic acid (I) in the plasma of the venous blood issuing from the muscle of the cat or rabbit in the steady state of activity is significantly $<$ in the muscle itself, and remains lower in the early part of the recovery period. It is hence impossible to calculate an "oxidative quotient" for (I) in man on the basis of changes of blood-(I), and also unnecessary to postulate an "alactacid" mechanism for anaerobic performance of work.

R. N. C.

Rate of lactic acid removal in exercise. E. V. NEWMAN, D. B. DILL, H. T. EDWARDS, and F. A. WEBSTER (Amer. J. Physiol., 1937, 118, 457—462).—Blood-lactic acid (I) is not usually increased in exercise at >12 times the basal rate of O_2 consumption. Pre-

vious reports that the rate of removal of (I) is a logarithmic function of time are confirmed. The rate increases approx. \propto the metabolic rate to a crit. level of activity, sp. for each subject. R. N. C.

Metabolism of lactic and pyruvic acids in normal and tumour tissues. V. Synthesis of carbohydrate. M. P. BENOY and K. A. C. ELLIOTT (Biochem. J., 1937, 31, 1268—1275).—Synthesis of carbohydrate by slices of rat liver was observed with 0.04M-*dl*-lactate and with 0.02M-pyruvate as substrates. Kidney cortex synthesised carbohydrate from lactate, pyruvate, succinate, fumarate, malate, and alanine. A 4- to 5-fold increase in concn. of the substrate suppressed synthesis. Brain, testis, and tumour tissue showed no synthesis from lactate or pyruvate. J. L. C.

Pyruvate oxidation in brain. III. Nature, specificity, and course of oxidation catalysed by vitamin-B₁. G. K. MCGOWAN and R. A. PETERS (Biochem. J., 1937, 31, 1637—1641).—The "pyruvate oxidase" system in pigeon's brain containing vitamin-B₁ does not utilise succinic, α -keto-glutaric or α -adipic acid, or CH₃Ac·CO₂H as substrate nor do these acids increase the rate of oxidation of AcCO₂H. Hence the system is not a general α -keto-oxidase and appears to be sp. for pyruvate. F. O. H.

Digitalis in body-fluids of digitalised patients. M. A. SCHNITKER and S. A. LEVINE (Arch. Int. Med., 1937, 60, 240—250).—Digitalis was demonstrated in the oedema fluid in amounts sufficient to cause clinical symptoms. H. G. R.

Reabsorption of glucose from the renal tubule in amphibia and the action of phloridzin on it. A. M. WALKER and C. L. HUDSON (Amer. J. Physiol., 1937, 118, 130—143).—Glucose (I) is reabsorbed in the proximal convoluted tubule of *Necturus* and the frog, but not in the distal convoluted tubule. The degree of reabsorption is reduced by increased rate of flow through the tubule, or by high plasma-(I). Reabsorption is unaffected by increase of [NaCl] in the tubule fluid to vals. that double the osmotic pressure of the tubule fluid. Phloridzin (II) prevents reabsorption of (I) in the tubule, but H₂O reabsorption continues. (I) passes into the blood if the concn. in the tubule fluid becomes considerably > plasma-(I). (II) does not appear to interfere with esterification of (I) by kidney phosphatase, nor does CH₃I·CO₂H selectively diminish (I) reabsorption; these results do not support Lundsgaard's hypothesis (see A., 1933, 1076). R. N. C.

Site of acidification of the urine within the renal tubule in amphibia. H. MONTGOMERY and J. A. PIERCE (Amer. J. Physiol., 1937, 118, 144—152).—Acidification takes place in the distal convoluted tubule in *Necturus*, the cells responsible being situated near the distal end of this segment. The functions of the cells are not affected by increase of blood-*p_H* with NaHCO₃. R. N. C.

Rôle of the tubule in the excretion of urea by the amphibian kidney: ultramicro-determination of urea-nitrogen. A. M. WALKER and C. L. HUDSON (Amer. J. Physiol., 1937, 118, 153—166).—Concn. of urea occurs in the distal convoluted tubule

of *Necturus*, the proximal tubule being permeable to urea in either direction. The frog kidney concentrates urea to an extent varying with the plasma-urea concn., the concn. occurring largely in the distal tubule. Improvements are described in the technique of the ultramicro-determination of urea-N.

R. N. C.

Rôle of the tubule in the excretion of inorganic phosphates by the amphibian kidney. A. M. WALKER and C. L. HUDSON (Amer. J. Physiol., 1937, 118, 167—173).—Concn. of PO₄^{'''} occurs progressively throughout the whole length of the tubule of *Necturus* and the frog, the process being slightly augmented in the distal tubule. The proximal tubule of *Necturus* is permeable to PO₄^{'''} in either direction. The proximal tubules of both species are capable of reabsorbing PO₄^{'''}. R. N. C.

Total molecular concentration and chloride concentration of fluid from different segments of the renal tubule of amphibia: site of chloride reabsorption. A. M. WALKER, C. L. HUDSON, T. FINDLEY, jun., and A. N. RICHARDS (Amer. J. Physiol., 1937, 118, 121—129).—Total mol. concn. and [Cl] in the fluid in the renal tubules of the frog and *Necturus* show little change from those of plasma until the fluid reaches the distal convoluted tubule, where they show marked decreases through reabsorption. R. N. C.

Rate of excretion of cobalt by sheep after drenching with cobalt chloride. H. O. ASKEW and S. W. JOSLAND (New Zealand J. Sci. Tech., 1937, 18, 888—892).—Rams drenched with 4 mg. of Co as CoCl₂ excreted most of the Co in the urine and faeces in the first 48 hr., and the whole in 5 days.

L. D. G.

Subacute magnesium deficiency in rats. E. WATCHORN and R. A. McCANCE (Biochem. J., 1937, 31, 1379—1390).—Rats on a diet containing 40 p.p.m. of Mg but otherwise adequate exhibit symptoms of disease after approx. 10 days but become apparently healthy after a further 7—10 days; at the end of 3 months disease again appears. Mg deficiency results in calcification of the kidneys, brittleness of the bones, whiteness or translucency of the teeth, approx. 50% decrease in the Mg content of the blood and teeth, approx. 33% decrease in that of the bones, increase in the H₂O content of bones, teeth, and kidneys, and decrease in the P content of the teeth. The Mg content of the soft tissues and the phosphatase contents of the blood, bones, and kidneys are not affected. W. McC.

Hexocystine and hexomethionine.—See A., II, 403.

Structure in relation to living biological functions. J. H. SCHULMAN (Trans. Faraday Soc., 1937, 33, 1116—1125).—When a suitable polar compound is injected into the substrate of a unimol. film of a second polar compound, the injected compound can enter the film to form a very strong mixed film with modified surface potential. This is attributed to dipole interaction between the mols. and can occur with a compound too sol. to form a film alone. The gel-like structure of protein spread in a

unimol. film is attributed to intermol. dipole association. A mixed film of gliadin and cholesterol appears to form a double-layer film on compression, the OH dipole of the cholesterol anchoring a polar group of the protein unit. At lower pressure, a gel-like mixed film is formed. Protein films can also adsorb mols. from the substrate, the surface pressure of the film remaining const. but the surface potential changing. The results are applied to explain the mechanism of hæmolysis and agglutination. J. W. S.

Animal membranes. A. KROGH (Trans. Faraday Soc., 1937, 33, 912—919).—Animal membranes are classified into surface membranes of cells, exudation membranes, membranes built up of cells or syncytia, and membranes of complex structure. Examples are discussed with reference to this classification. J. W. S.

Apparent permeability of the capillary membrane in man. A. KEYS (Trans. Faraday Soc., 1937, 33, 930—939).—The blood vascular capillary membranes are permeable to H_2O and salts, but, after displacement, the osmotic balance is readjusted mainly by shift of H_2O and only secondarily by shift of salts. The order of rates of diffusion across the membrane is $H_2O > \text{urea} > K^+, Na^+, Cl^-, NO_3^- > Ca^{++}, Mg^{++}, PO_4^{---} > \text{glucose}, SO_4^{--}, SCN^- > \text{sucrose}$. The membrane behaves like a collodion membrane with pores of radius generally $< 2 \times 10^{-7}$ cm., but with occasional larger holes. J. W. S.

Methods of measuring surface forces of living cells. E. N. HARVEY (Trans. Faraday Soc., 1937, 33, 943—946).—The centrifuge, compression, kinetic, and sessile drop methods of determining the surface forces of naked cells are described, and the results compared. The methods show that the surface has elastic properties and that the sum of the surface and elastic tensions is low (0.1—3 dynes per cm.). J. W. S.

Electric impedance of marine egg membranes. K. S. COLE (Trans. Faraday Soc., 1937, 33, 966—972).—Impedance measurements over the frequency range 1—16,000 kc. indicate that the membrane resistance of unfertilised and fertilised *Hippoonæ* eggs is > 25 ohms per sq. cm. The plasma membrane capacities of unfertilised and fertilised eggs are: *Hippoonæ* 0.87, *Asterias* 1.1, and *Arbacia* 0.73 $\mu F.$ per sq. cm., respectively. The membrane capacity of *Hippoonæ* eggs is decreased by swelling in dil. sea- H_2O . The fertilisation membrane capacities are: *Hippoonæ* 2.0 and *Arbacia* 3.1 $\mu F.$ per sq. cm. At frequencies > 1000 kc., an unidentified structure becomes important, the effect being a max. at about 16,000 kc. J. W. S.

Properties of the gill membranes of fishes. A. KEYS (Trans. Faraday Soc., 1937, 33, 972—981).—The osmotic pressures of the blood of fishes and of their environment indicate that gill membranes are relatively impermeable to H_2O and salts, but that, excepting in euryhaline fishes, this impermeability is destroyed when the normal osmotic gradient across the membrane is reversed. The membranes permit free passage of CO_2 , O_2 , and NH_3 and, excepting in elasmobranchs, are relatively permeable to urea. The membrane allows small amounts of H_2O and minute

amounts of Na^+ and Cl^- to pass, but is absolutely impermeable to IO_3^- , $Fe(CN)_6^{---}$, SO_4^{--} , Ca^{++} , and glucose. The secretory work by the gills of marine teleosts may be due to an oxidative mechanism. J. W. S.

Resting potentials of muscle and nerve, and depolarisation by various agencies. S. L. COWAN (Trans. Faraday Soc., 1937, 33, 1023—1028).—Experimental data on resting potentials are summarised. It is suggested that the potential is due to increased permeability of the injured membrane by, e.g., removal of certain cations normally present on its outer surface. The discharge of the injury potential will permit extension of the change in permeability at the injured point and add to the cations at the anode (uninjured point). J. W. S.

Physico-chemical basis of electrotonus. H. ROSENBERG (Trans. Faraday Soc., 1937, 33, 1028—1035).—Core-conductor models which reproduce the electrotonus observed in nerves are discussed. Experimental results support the assumption that the cathodic potential which is manifested as electrotonus is the intrinsic stimulus for the nerve membrane in physiological activity. J. W. S.

Physical and chemical properties of nerve fibres and the nature of synaptic contacts. J. Z. YOUNG (Trans. Faraday Soc., 1937, 33, 1035—1040).—The physical structure of nerve fibres and the function of the various layers in nerve conduction are discussed. J. W. S.

Bio-electrical properties of frog skin. R. B. DEAN and O. GATTY (Trans. Faraday Soc., 1937, 33, 1040—1046).—Existing knowledge of the bio-electrical behaviour of frog's skin is summarised. J. W. S.

Skin potentials in human subjects. W. F. FLOYD and C. A. KEELE (Trans. Faraday Soc., 1937, 33, 1046—1049).—The palmar surfaces of the hands and fingers and plantar and dorsal surfaces of the feet ("active regions") show typical variations of potential relative to the other ("inactive") regions of the skin after suitable stimulation, e.g., by noise, electric shock, or a deep breath. The potential cannot be correlated with skin temp. and is independent of area of contact. J. W. S.

Factors in membrane permeability.—See A., I, 512.

Activation energy of diffusion through natural and artificial membranes.—See A., I, 513.

Effect of the pancreas on the serum-phosphatase of dogs. S. FREEMAN and A. C. IVY (Amer. J. Physiol., 1937, 118, 541—548).—Serum-phosphatase (I) is only slightly affected by atrophy of the pancreas, but pancreatectomy causes a rise followed by a fall. The increase is $<$ that following occlusion of the common bile duct, which effect is unaltered by pancreatectomy. Sucrose in the pre-operative diet augments the effect of pancreatectomy on (I), but raw pancreas has no significant effect. R. N. C.

Mobilisation and formation of glycogen and fats in enervated muscle. F. CEDRANGOLO (Boll. Soc. ital. Biol. sperim., 1937, 12, 185—186).—

Section of the sciatic nerve is followed by increases in the glycogen (I) content in dogs and frogs. In dogs, fasting produces a total lack of fat mobilisation in the muscle and, during a period of nutrition, a formation of (I) and fat equal to that of the control innervated muscle.

F. O. H.

Chemical and histological changes in denervated skeletal muscle of the monkey and cat. H. CHOR, R. E. DOLKART, and H. A. DAVENPORT (Amer. J. Physiol., 1937, 118, 580—587).—The H_2O content of the denervated muscle is unaltered, although its extractability by $COMe_2$ is facilitated in the later stages of atrophy. Total N and lipin are unaffected, but total P falls within a week of denervation.

R. N. C.

Significance of the adrenals for adaptation. H. SELYE (Science, 1937, 85, 247—248).—Evidence for the view that the function of the adrenals is to increase the resistance of the organism to stimuli that produce an alarm reaction is summarised. Rats previously adapted to certain stimuli tolerate exposure to these stimuli even after adrenalectomy. The adrenals are concerned in the first stage of adaptation, but further adaptation is governed by changes in the peripheral tissues; the stimulus ceases to be an alarm and adrenal hormones are no longer required. The symptoms of an alarm reaction are assumed to be due mainly to the liberation from the tissues of a toxic metabolite, possibly histamine. Loss of Na or increase of K or of non-protein-N are also symptoms rather than the cause of adrenal insufficiency.

L. S. T.

Significance of the adrenals for adaptation to mineral metabolism. E. C. KENDALL and D. J. INGLE (Science, 1937, 86, 18—19).—In adrenalectomised dogs, maintained without cortin on a diet containing much NaCl and Na citrate, addition of gradually increasing amounts of K⁺ or sudden variations in the NaCl content in the diet results in an acquired tolerance by the animal. During stimulation of muscles in adrenalectomised rats blood-serum-K increases, and as failure approaches the $[K^+]$ rises to 30—40 mg. per 100 c.c. The increase in K is more sudden in presence of thyroxine. The primary change is probably inability to resist sudden changes in the concn. or distribution of electrolytes (cf. preceding abstract). K should be included as one of the toxic metabolites postulated by Selye.

L. S. T.

Mechanism of stimulation of carotid gland chemoreceptors. C. V. WINDER (Amer. J. Physiol., 1937, 118, 389—398).

R. N. C.

Present position of radiation-genetics. H. STUBBE (Naturwiss., 1937, 25, 483—490, 500—506).—A general review of recent work on the effect of various types of radiation in producing mutations.

W. O. K.

Origin of bio-electric phenomena. K. H. MEYER (Trans. Faraday Soc., 1937, 33, 1049—1051).—Action currents may arise through a chemical change in a membrane or variation in the p_H of the surrounding medium, and probably only secondarily through the consequent change in the ionic permeability of the membranes.

J. W. S.

Radiations, cell permeability, and colloidal changes. S. TCHAKHOTINE (Trans. Faraday Soc., 1937, 33, 1068—1072).—The author's investigations by the micro-ray puncture method are described briefly. Radiations of suitable λ increase the permeability of the surface layer of the cell, owing to disaggregation of the cell membrane, and also change the colloidal state of the proteins and other complex substances in the cytoplasm. The effects are generally obtained with 2800 Å. radiation, but not with 2930 or 3100 Å. unless the object is photosensitised, e.g., with eosin.

J. W. S.

Effect of α -rays on surviving tissue. B. RAJEWSKY and K. INOUE (Naturwiss., 1937, 25, 540—541).—Tumour tissue was submitted to the action of α -rays in Ringer's solution containing Ra emanation. Layers of tissue, of thickness about twice the range of α -particles in the tissue, were used. The anaerobic glycolysis of the tissue was examined at 6° and 37°. There is a definite connexion between the no. of α -particles and the decrease in glycolysis.

A. J. M.

Effect of ultra-violet and X-rays on the oxidation-reduction potentials of frog's muscle *in vivo*. Y. UCHIMURA (J. Biochem. Japan, 1937, 25, 207—217).— E_h (normally + 230 mv.) is increased by ultra-violet or X-irradiation, the latent period being greater with X-rays. The increase occurs only when both dehydrogenase and H donor are present. Increase of reduced glutathione occurs with limited irradiation.

F. O. H.

Existence of products of histolysis caused by absorption of tissues damaged by X-rays in rabbits. J. LOISELEUR and C. CROVISIER (Compt. rend. Soc. Biol., 1937, 125, 923—925).—Products of histolysis, adsorbed on the proteins of the blood-plasma, can be demonstrated after irradiation of the thymus.

H. G. R.

Histochemistry of the neutral fats and lipins of the irradiated skin of normal, hypernephrectomised, and fasting animals. B. JALOWY and S. MALCZYNSKI (Compt. rend. Soc. Biol., 1937, 125, 1090—1092).—Active secretion of the sebaceous glands occurs, covering the epidermis with a thick layer of fatty substances.

H. G. R.

Effects of X-rays on frog skin. A. E. LIGHT (Radiol., 1935, 25, 734—738).—Dilation of capillaries, X-ray shock, and increased N elimination following irradiation result from the release and diffusion of "H" substance from injured cells. The effect is due directly to X-rays or to secondary cathode rays produced by the primary beam impinging on the tissue.

CH. ABS. (p)

Radiation of heat from the human body. V. Transmission of infra-red radiation through skin. J. D. HARDY and C. MUSCHENHEIM (J. Clin. Invest., 1936, 15, 1—9).—Approx. 95% of infra-red rays are absorbed within 2 mm. of the surface. Therapeutic effects are confined to the surface.

CH. ABS. (p)

Development of eye colours in *Drosophila*. Relationship between pigmentation and release

of diffusible substances. B. EPHRUSSI and S. CHEVAIS (Proc. Nat. Acad. Sci., 1937, 23, 428—434).
E. M. W.

Effect of changes in p_H on the action of mammalian A nerve fibres. J. E. LEHMANN (Amer. J. Physiol., 1937, 118, 600—612).
R. N. C.

Effect of changes in the potassium-calcium balance on the action of mammalian A nerve fibres. J. E. LEHMANN (Amer. J. Physiol., 1937, 118, 613—619).—Exclusion of Ca^{++} from the solution or its de-ionisation with citrate affect the nerve in a similar manner to increase of p_H , whilst exclusion of K^+ affects it similarly to lowering of p_H .
R. N. C.

Influence of mineral electrolytes in the biochemical synthesis of polyholosides. G. MALFITTANO and M. CATOIRE (Ann. Ferm., 1937, 3, 52—55).—A crit. review.

Prolongation of action of the pituitary antidiuretic substance, and of histamine, by metallic salts. E. C. DODDS, R. L. NOBLE, H. RINDERKNECHT, and P. C. WILLIAMS (Lancet, 1937, 233, 309—311).—With rats, the addition of aq. $Zn(OAc)_2$ prolongs the antidiuretic activity of a posterior pituitary extract. Cd^{++} and Ni^{++} have an action similar to but $>$ that of Zn^{++} . The effects of other metallic salts are recorded. The presence of $Zn(OAc)_2$ prolongs the action of histamine acid phosphate or hydrochloride in stimulating gastric secretion in cats.
L. S. T.

Traumatic shock and mineral constituents of the blood. G. STOLFI and A. LALLI (Boll. Soc. ital. Biol. sperim., 1937, 12, 161—162).—Traumatic shock in rabbits decreases the Na^+ and Ca^{++} and increases Cl^- (especially plasma- Cl^-) content of the blood.
F. O. H.

Reaction of amphibian skeletal muscle to calcium ion and ionisation of calcium citrate. I. CHAO (Chinese J. Physiol., 1937, 12, 101—107).—In aq. Ca citrate the response of the toad sartorius to const. electrical stimulation depends on $[Ca^{++}]$ and not on total Ca, and it can be used for determination of $[Ca^{++}]$. The results obtained support the hypothesis of Hastings *et al.* (A., 1934, 1307) that ionisation of Ca citrate takes place in two stages.
J. N. A.

Comparative effect on the blood-sugar of the rabbit of sodium fluoride, chloride, bromide, and iodide. R. HAZARD, C. VAILLE, and Y. CAGNAUX (J. Pharm. Chim., 1937, [viii], 26, 101—105).—Intravenous injection of 5.0% aq. NaCl, NaBr, or NaI (in doses of 0.1—1.0 g. per kg. body-wt.) into rabbits produces an irregular hyperglycemia lasting several hr. 1.0% NaF in doses of 0.02—0.05 g. has a more marked hyperglycemic action.
W. O. K.

Effect of air-borne iodine from Brittany on the iodine supply in central Europe. H. CAUER (Biochem. Z., 1937, 292, 116—140).—Part of the I escaping into the atm. in Brittany during I production from seaweed probably reaches Germany and other central European countries in amounts sufficient to have significant biological consequences. In 1933 and 1934, approx. 13,000 kg. of I escaped thus from the Breton kelp-burning localities.
W. McC.

Effect of mono-, di-, and tri-calcium phosphates on reproductive success in rats. W. M. COX, jun., and M. IMBODEN (J. Nutrition, 1936, 12, 509—514).—When fed at high Ca levels (2.45%) $Ca(H_2PO_4)_2$ was unsuitable for reproductive purposes. $Ca_3(PO_4)_2$ was superior to $CaHPO_4$ but the difference would probably not be apparent at lower levels of feeding.
A. G. P.

Effect of feeding excess of cobalt to healthy sheep. S. W. JOSLAND (New Zealand J. Sci. Tech., 1937, 19, 31—37).—Feeding 5 mg. of Co as $CoSO_4$ per kg. body-wt. to sheep caused polycythemia in one and mild anemia in two cases. Daily feeding of 5 mg. of Co caused two cases to become anemic in 10 months. Co is not toxic and a small storage in the organs occurs.
W. L. D.

Erythrocyte reaction of the dog to cobalt. G. BREWER (Amer. J. Physiol., 1937, 118, 207—210).
R. N. C.

Pharmacological application of furfuraldehyde.—See A., II, 428.

Action of certain substituted phenols on marine eggs in relation to their dissociation. A. TYLER and N. H. HOROWITZ (Proc. Nat. Acad. Sci., 1937, 23, 369—374).—The action of various nitro- and chloro-phenols on sea urchin eggs \propto the concn. of undissociated mols. in the solution applied, i.e., the compounds penetrate the cell in the undissociated form. Within the cell the mols. dissociate and their action in stimulating respiration and in causing reversible blocking of cleavage is controlled by the concn. of the dissociated form.
A. G. P.

Physiological action of $[\beta-3:4]$ -dihydroxyphenylethylamine and sympathol. M. R. GURD (Quart. J. Pharm. 1937, 10, 188—211).—In their physiological action, the two drugs are intermediate between adrenaline (I) on the one hand, and tyramine and ephedrine on the other. The results indicate that the presence of the 3:4-(OH) $_2$ -groups is of more importance in producing a (I)-like action than is the structure of the side-chain.
J. N. A.

Friedel-Crafts reaction. I. Synthesis of new pharmaceutical [heterocyclic] compounds.—See A., II, 432.

Is castor oil the cause of alimentary disequilibrium as the result of its purgative action bringing about a partial or total inhibition of resorption? R. LECOQ (Bull. Sci. Pharmacol., 1937, 44, 156—163).—The replacement, in the diet, of castor oil by a corresponding quantity of ricinoleic acid, which has a more intense purgative action, results in greater disequilibrium. In pigeons on a diet rich in castor oil, the resorption of lipins was $>$ 85%. It is unlikely that the disequilibrium is due directly to inhibition of resorption.
W. O. K.

Effect of intravenous injection of glycogen on the quantity of glycogen in the organs. J. PELCZARSKA (Compt. rend. Soc. Biol., 1937, 125, 1079—1081).—Glycogen (I) is decreased in the liver and increased in the lung of rabbits by a single injection. When injected over a period of 2 days,

there is an increase in lung-(I) but no change in liver-(I) in dogs. H. G. R.

Lecithin and liver-glycogen, blood-sugar, and glycosuria in normal and thyroidectomised animals. VI. F. VACIRCA (Boll. Soc. ital. Biol. sperim., 1937, 12, 123—125; cf. this vol., 265).—Injection of aq. emulsions of lecithin into fasting (12 hr.) rabbits diminishes glycosuria and hyperglycaemia due to injection of glucose, whilst with a 36 hr. fast the glycosuria and hyperglycaemia are increased; in all animals, storage of liver-glycogen is diminished. The phenomena do not occur after thyroidectomy. F. O. H.

Effect of parenterally administered peptone. G. MILLES and L. SEED (Arch. Int. Med., 1937, 60, 251—263).—Diuresis and a decrease in the spinal fluid- and blood-pressure were observed in dogs. H. G. R.

Effect of eserine on the stability of the complex present in the brain liberating acetylcholine on heating. E. CORTEGGIANI (Compt. rend. Soc. Biol., 1937, 125, 944—945).—The complex is unstable in the absence of eserine or NaCl. H. G. R.

Reconstitution *in vitro* of the complex liberating acetylcholine in the brain. E. CORTEGGIANI, A. CARAYON-GENTIL, J. GAUTRELET, and A. KASWIN (Compt. rend. Soc. Biol., 1937, 125, 945—947).—The complex can be re-formed by adding acetylcholine to brain tissue. H. G. R.

Presence of a complex liberating acetylcholine on heating in various organs of vertebrates. E. CORTEGGIANI (Compt. rend. Soc. Biol., 1937, 125, 949—951). H. G. R.

Action of acetylcholine on isolated muscle. A. MARNAY (Compt. rend. Soc. Biol., 1937, 125, 1007—1009).—No change occurs in the adenylypyrophosphoric acid or hexose mono- or di-phosphate whilst phosphagen is decreased after anaërobiosis in presence of eserine. H. G. R.

Action of acetylcholine on minced muscle. A. MARNAY (Compt. rend. Soc. Biol., 1937, 125, 1009—1011).—Acetylcholine increases glycolysis in minced as in isolated muscle (A., 1936, 757). H. G. R.

Pharmacodynamics of the anterior dorsal muscle of the leech; biological reagent for acetylcholine. P. DODEL and G. DASTUGUE (Bull. Sci. Pharmacol., 1937, 44, 145—155).—The effect of various agents and conditions on the behaviour of the muscle is reported, with special reference to the action of acetylcholine. W. O. K.

Trophophylaxis, a new property of foods. P. LASSABLIÈRE (Compt. rend., 1937, 204, 1893—1894).—Many substances, including proteins, carbohydrates, fats, and inorg. salts, when administered orally or subcutaneously, protect mice against a lethal dose of cobra venom. Animals suffering from inanition are 2—10 times as sensitive to the venom as controls. These "trophophylactins" are stable at 100°. J. L. D.

"Caseinic acid" in tissue culture. V. TROTTZKI (Trud. Lab. Izuch. Belka Belkovo Obm. Organ., 1935, No. 8, 36—40).—Casein had no ill-effects on

cultures in "natural solvent" or blood plasma, and small proportions of Na caseinate-HCl stimulated growth on plasma substrates. CH. ABS. (p)

Protective action of certain purines against liver necrosis produced by carbon tetrachloride and chloroform. R. C. NEALE (Science, 1937, 86, 83—84).—The cryst. substance from hog liver (this vol., 295) which protects rats from liver necrosis in CCl₄ poisoning is a purine, probably Na xanthine (I). Na guanine and (I) have the same protective action as the liver prep., and also protect the livers of rats in CHCl₃ poisoning. L. S. T.

Combined effect of local anaesthetics. I. A. RABBENO. II. Percaine-cocaine and percaine-tutocaine. F. CAVALLI and A. PATANIA (Boll. Soc. ital. Biol. sperim., 1937, 12, 125—127, 127—130).—I. Methods of investigation are discussed.

II. Mixtures of anaesthetics of the same type [e.g., percaine (I) and tutocaine] exhibit phenomena of summation, synergism, and antagonism whilst those of different types [e.g., (I)-cocaine] exhibit only summation and synergism. F. O. H.

Effect of temperature on the production of anaesthesia by propyl bromide and the anaesthetic content of the brain of the gudgeon maintained at 12—25°. M. TIEFFENEAU and D. BROUN (Compt. rend. Soc. Biol., 1937, 125, 989—991).—The time for production of anaesthesia at 15° is twice that at 25°, the concn. of PrBr present in the brain being the same at the onset of anaesthesia. H. G. R.

Effect of decreased temperature on production of anaesthesia by propyl bromide and the anaesthetic content of guinea-pig's brain. M. TIEFFENEAU and H. BARCLAY (Compt. rend. Soc. Biol., 1937, 125, 991—993).—At decreased temp. the rate of production of anaesthesia is increased and the concn. of PrBr in the brain is lower at the onset of anaesthesia. H. G. R.

Theory of narcosis. K. H. MEYER (Trans. Faraday Soc., 1937, 33, 1062—1064; cf. A., 1935, 893; 1936, 240).—Experimental evidence indicates that narcosis begins when any chemically indifferent substance reaches a certain molar concn. in the lipid alcohols of the cell substance. This concn. depends on the nature of the animal or cell but is independent of the narcotic. J. W. S.

Action of narcotics on enzymes and cells. A. J. CLARK (Trans. Faraday Soc., 1937, 33, 1057—1061).—Published data on the action of narcotics on cells are summarised. They can be most easily explained by the hypothesis that the narcotics are absorbed on the surfaces of the cells, but most can also be interpreted by the alternative theory that the drugs dissolve in and alter the cell-lipins. The inhibition of the action of certain purified enzymes by narcotics suggests that they act in a similar manner *in vitro* and *in vivo*. J. W. S.

Hypnotic effects of *as*-arylalkylcarbamides.—See A., II, 404.

Anaesthetic action of alkaloids of *Erythrophloeum*. E. TRABUCCI (Arch. Farm. sperim.,

1937, 64, 97—129, and Boll. Soc. ital. Biol. sperim., 1937, 12, 234—237; cf. this vol., 179).—Compared with percaïne (I) for their anæsthetic action on mucosa, the alkaloids (II) give the series madagascar > omofeine > erythrofeine > (I) > cassaine > norcassaidine. The anæsthetic action of (II) is slow in manifestation but of long duration. F. O. H.

Eserine and muscular function. I. Total acid-soluble phosphorus in eserinated muscle. E. MARTINI, C. TORDA, and L. BELLONI. II. Phosphagen in eserinated muscle. E. MARTINI and C. TORDA. III. Heat-contraction, total acid-soluble phosphorus, and phosphagen in eserinated muscle. C. TORDA (Boll. Soc. ital. Biol. sperim., 1937, 12, 97—98, 98, 99).—I. Neither faradic stimulation nor injection of eserine increases the content of acid-sol. P (I) in frog's gastrocnemius; stimulation of the eserinated muscle, however, increases (I). II. The phosphagen (II) content (normally 0.059%) is increased to 0.077%.

III. Eserination of muscle does not affect the heat-contraction; (I) is unchanged but (II) is increased. F. O. H.

Blood-sugar level after administration of eserine and atropine. M. C. HRUBETZ (Amer. J. Physiol., 1937, 118, 300—301).—Eserine causes a rise in blood-sugar in the rat, which reaches a max. in 1 hr. and returns to normal in 2 hr.; atropine abolishes the effect. R. N. C.

Influence of sympathetic and parasympathomimetic drugs on intestinal absorption of peptone and glycine. G. COSTA (Arch. Fisiol., 1937, 37, 170—179).—With aq. peptone, absorption of the H_2O in dogs with fistulæ is increased by pilocarpine (I), atropine (II), and adrenaline and decreased by ergotamine (III) whilst that of N is decreased by (I) and (II) and increased by (III). With aq. glycine, no significant changes in absorption occur. The effect of the drugs appears to increase with increasing mol. wt. of the absorbed substance. F. O. H.

Effect of the diffusion factor (-R) on absorption of drugs. I. Rate of absorption of subcutaneously and intramuscularly injected strychnine. II. Rate of absorption of intraperitoneally injected strychnine. U. SAMMARTINO (Arch. Farm. sperim., 1937, 64, 53—74, 89—96).—Injection of testicle (ox) extract containing the diffusion factor-R (cf. Strum *et al.*, A., 1933, 302) significantly increases the rate of absorption of strychnine salts administered by the above routes. F. O. H.

Effect of phloridzin on liver-glycogen and residual nitrogen in nephrectomised animals. C. ARDY and G. GALLO (Boll. Soc. ital. Biol. sperim., 1937, 12, 137—138).—Liver-glycogen (rat) is increased but the effect on residual N is not conclusive. F. O. H.

Strychnine excitation and acetylcholine content of the central nervous system. O. LOEWI (Naturwiss., 1937, 25, 526).—The acetylcholine content of the central nervous system of frogs kept for several hr. in convulsion by strychnine is about twice that of normal frogs. A. J. M.

Pharmacology of pyrethrum flowers. H. ROSEN and M. R. THOMPSON (J. Amer. Pharm. Assoc., 1937, 26, 631—642).—The flowers, in which no volatile active constituent was found, are toxic (as aq. EtOH suspensions of the extract) to warm- and (more so) to cold-blooded animals. The main physiological actions and their mechanism are discussed. Two new methods of assay, using the frog and isolated rabbit's intestine, respectively, are described and examples of assay by various methods given. F. O. H.

Methyl alcohol and toxic methyl compounds. F. FLURY and W. WIRTH (Arch. Gewerbepath. Gewerbehyg., 1936, 7, 221—226).—The high toxicity of MeOH and certain Me compounds can be explained by their oxidation in the body to CH_2O . M. A. B.

Carbon monoxide intoxication in heavy smokers. A. RÜHL and P. LIN (Deut. med. Woch., 1936, 62, 493—497; Chem. Zentr., 1936, i, 3716—3717).—With heavy smokers who inhale, the blood-CO has a mean val. of 0.52 c.c. per 100 c.c., rising during smoking to 2 c.c.; non-inhaling smokers and moderate smokers show no such increase in blood-CO. H. N. R.

Increase of chromophilic substance in the adrenals in chronic carbon monoxide inhalation. F. J. SCHMELZER (Arch. Hyg. Bakt., 1935, 115, 1—8; Chem. Zentr., 1936, i, 3707—3708).—In acute CO poisoning of guinea-pigs the chromophilic substance in the adrenals diminishes. In chronic poisoning there is probably hyperfunction of the medulla cells. In sub-acute poisoning there is a slow approach to the chronic condition. A. G. P.

Detection of inhaled hydrocyanic acid. (A) G. D. ELDON and J. R. STUBBS. (B) G. R. LYNCH (Analyst, 1937, 62, 540, 540—541).—(A) The viscera of two cases of suspected HCN poisoning gave negative or inconclusive tests for HCN. 250 ml. of blood from the lungs were steam-distilled until 15 ml. of distillate collected, on which the Prussian-blue (I) and CNS' tests were carried out, with slight but definite results indicating 1 mg. of HCN per litre of blood.

(B) When the (I) and CNS' tests fail, the steam distillate is treated with $Pb(OAc)_2$ and dil. aq. H_2SO_4 in a conical flask over the mouth of which is placed a drop of aq. $AgNO_3$ on a microscope slide. In presence of HCN, $AgCN$ is identifiable by its characteristic cryst. appearance. Alternatively, or in addition, the alloxan test (A., 1921, ii, 359) is applied. E. C. S.

Occurrence of "mottled enamel" of teeth in Alberta and its relation to the fluorine content of the water supply. O. J. WALKER and E. Y. SPENCER (Canad. J. Res., 1937, 15, B, 305—314).—In areas where mild mottled enamel is endemic, deep wells show a high F content (1—4 p.p.m.). A. Li.

Electrolyte balance during recovery from mercuric chloride poisoning. J. H. TALBOTT, F. S. COOMBS, and W. V. CONSOLAZIO (Arch. Int. Med., 1937, 60, 301—311).—After a 6-day period of anuria the following changes were observed in the body-fluids: decrease in base, Cl' , serum-protein and

-hæmoglobin, increase in acid, and retention of $\text{PO}_4^{'''}$ and N products. H. G. R.

Toxicity of ammonium ions. B. BASSANI and A. FERRANTE (Arch. Fisiol., 1937, 37, 180—189).—When short periods are allowed for recovery and no protective mechanism is afforded against exhaustion of the alkaline reserve of the blood, the lethal dose of intravenously injected NH_4Cl (as NH_4^+) in dogs is approx. 0.15 g. per kg.; simultaneous injection of NaHCO_3 greatly increases this val. With cessation of injection, recovery is rapid. Conversion of NH_4^+ into urea is discussed. F. O. H.

Influence of histolysates on enzymic processes. A. M. UTEVSKI and N. S. LEVANTZOVA (Med. exp. Ukraine, 1934, No. 1, 23—30).—In dog blood of high total glutathione (I) content, hepatolysate (II) in high- or low-mol. fractions has little effect; in blood of low (I) content (II) causes a sharp increase in (I). CH. ABS. (p)

Action of short radio waves on enzymes. N. A. ROSHANSKI and E. I. SMIRNOVA (J. Physiol. U.S.S.R., 1935, 19, 692—704).—No direct chemical action of short waves (5—10 m.) on various enzymes was observed. The action of the waves on living tissue is due to overheating of capillaries and disintegration of intracellular structure. CH. ABS. (p)

Biochemical hydrogenations. VI. New kind of enzymic hydrogenation of fumaric acid. F. G. FISCHER and H. EYSENBACH (Annalen, 1937, 530, 99—120; cf. this vol., 219).—A fumarate-hydrogenase (I) is obtained from bottom yeast by drying, macerating with H_2O at 37° , and purifying approx. as for the prep. of the yellow enzyme; further purification cannot be effected by solvents, but tenfold concn. is brought about by adsorption from H_2O on $\text{Al}_2\text{O}_3\text{-C}$, elution with aq. Na_2HPO_4 , and fractional pptn. by $(\text{NH}_4)_2\text{SO}_4$. This product still contains flavin-enzymes and EtOH-dehydrogenase, but no polysaccharides; its activity is unaffected by dialysis in Cellophane against H_2O and is thus independent of any dialysable co-enzyme. (I), freed from lacto-flavin phosphate by dialysis, effects reduction of Na fumarate to Na succinate by reduced Janus-red; neither the dye nor (I) alone is effective, nor does (I) affect the reduced dye. The reaction, followed colorimetrically in a special apparatus (described), has a temp. coeff. of 1.73—1.75 at $10\text{--}30^\circ$, but of only 1.5 at 40° owing to inactivation by heat, which is complete at 50° ; the velocity reaches a flat max. at about p_{H} 6.5, decreasing rapidly at about p_{H} <5.5 and >8, and is independent of the fumarate concn. but directly \propto the amount of (I) and dye. Other dyes can be used, but the velocity of the reaction depends on the redox potential of the dye, being negligible if this is -0.1 v. and decreasing very rapidly if it is <-0.2 v., which differentiates (I) sharply from succinodehydrogenase. The reaction is not hindered by addition of succinate, malonate, $\text{CH}_2\text{I-CO}_2\text{H}$, KCN, CHCl_3 , or NaF. Malic acid dehydrogenates reduced Janus-red in the presence of crude, but not of pure, (I). Na maleate effects dehydrogenation, but at 0.1 the rate of the fumarate; muconates, itaconates, crotonates, cinnamates, and

oxaloacetates are ineffective. The possible biological significance of the reaction is discussed. R. S. C.

Equilibria in dehydrogenase systems. H. HELLSTRÖM, E. ADLER, and H. VON EULER (Svensk Kem. Tidskr., 1937, 49, 194—196).—Theoretical. M. H. M. A.

Components of dehydrogenase systems. XIV. Glutamic acid dehydrogenase from yeast. H. VON EULER, E. ADLER, and T. S. ERIKSEN (Z. physiol. Chem., 1937, 248, 227—241; cf. A., 1936, 1418).—Dry material obtained from maceration-juice of bottom yeast by pptn. with COMe_2 contains a thermolabile apodehydrogenase (I) which acts specifically (asparagine, *l*-aspartic acid, *d*-arginine, *d*-ornithine, *l*-tyrosine, *dl*-proline, *dl*-alanine, glycine, glutathione not affected), in conjunction with codehydrogenase-II (not with cozymase) on glutamic acid with production of small amounts of NH_3 , the yellow enzyme acting as H carrier between the dehydrocodehydrogenase-II produced in the first phase of the reaction and the acceptor (methylene-blue, O_2). The (I) system, which exhibits optimal activity at p_{H} 8, is not affected by KCN or $\text{P}_2\text{O}_7^{'''}$. W. McC.

Relation between rate of enzymic oxidation and stereochemical structure of ascorbic acid and its analogues. S. W. JOHNSON and S. S. ZILVA (Biochem. J., 1937, 31, 1366—1374).—*l*-Ascorbic acid, *d*-arabo-, *l*-gluco-, and *l*-galacto-ascorbic acid are directly oxidised by ascorbic acid oxidase from cucumber much more rapidly than are the corresponding enantiomerides. In the first group the oxidation proceeds at a linear rate but in the second the rate diminishes after some time. *l*-Arabo- and *d*-ascorbic acid are more rapidly oxidised than are *d*-gluco- and *d*-galacto-ascorbic acid. W. McC.

Peroxidases. IV. Determination of peroxidase activity from e.m.f. measurements. M. V. SITHARAMAN and S. RENGACHARI (J. Indian Chem. Soc., 1937, 14, 278—290; cf. A., 1936, 1417).—The peroxidase activity of plant saps can be determined from the amount of unaltered, added quinol, when used as substrate, the concn. of which is obtained from the e.m.f. of the quinone-quinol system under standard conditions. H. G. M.

Extraction and purification of Ricinus peroxidase. D. GARILLI (G. Biol. ind. agrar. aliment., 1936, 6, 1—16; Chem. Zentr., 1936, i, 3700).—*Ricinus* embryos are ground with quartz and NaH_2PO_4 , retaining the expressed sap. After ripening the dialysed solution is treated with $\text{Al}_2\text{O}_3\text{-C}$ (Willstätter and Kraut). The enzyme is adsorbed (p_{H} 4.0) and may be subsequently eluted with Na_2HPO_4 at p_{H} 8.0. The eluate is dialysed, concn. in a vac., and treated with 5 vols. of 95% EtOH to ppt. the peroxidase. A co-enzyme is present in the non-dialysable portion. A. G. P.

Aldehyde mutase. M. DIXON and C. LUTWAK-MANN (Biochem. J., 1937, 31, 1347—1365; cf. this vol., 220).—Aldehyde oxidase acts on aliphatic and aromatic aldehydes but does not dismute them; it is inactivated by KCN but not by $\text{CH}_2\text{I-CO}_2\text{H}$ and does not require a co-enzyme. Aldehyde

mutase (I), which is a distinct enzyme or enzyme system, requires a co-enzyme (cozymase very efficient, glutathione, trigonelline, and adenylyl pyrophosphate inactive), dismutates but does not oxidise aldehydes (aliphatic only), and is inactivated by $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$ but not by KCN. Alcohol dehydrogenase is not a component of the (I) system. W. McC.

Acetylcholine-esterase activity of enervated muscle. E. MARTINI and C. TORDA (Boll. Soc. ital. Biol. sperim., 1937, 12, 200—202).—Section of the ischiaticus nerve in rats produces, after 2 days, a decrease in the acetylcholine-esterase content of the corresponding gastrocnemius muscle, the val. after 12 days being approx. 26% of that of the control. F. O. H.

Choline-esterase in the nerves of the lobster. A. MARNAY and D. NACHMANSOHN (Compt. rend. Soc. Biol., 1937, 125, 1005—1007).—The concn. of the enzyme in the nerves is $>$ that of the other tissues examined. H. G. R.

Enzyme apparently active at low temperatures. T. WENSE (Fermentforsch., 1937, 15, 291—301; cf. A., 1936, 1559).—Cultures and extracts of *Paramecium* hydrolyse acetylcholine more rapidly at 5° than at 37° because the histamine (I) produced by accompanying bacteria inhibits the action of the esterase responsible for the hydrolysis, much more (I) being produced at 37° than at 5° . W. McC.

Lipase. III. Effect of ovarian follicular hormone on pancreatic lipase. Y. IWASAKI (J. Biochem. Japan, 1937, 25, 177—179).—Folliculin significantly accelerates the synthetic, and retards the hydrolytic, action of the lipase. F. O. H.

Polypeptidases in milk. R. ABDERHALDEN (Fermentforsch., 1937, 15, 302—310).—Fresh, separated, and dried human milk is rich in di- (I) and polypeptidases (II) which retain their activity for months in the dried material. Glycyl-*l*-tryptophan (III) is rapidly hydrolysed by the milk even at 0° . Cow's milk usually contains little or no (I) and (II) and hydrolyses (III) only slowly if at all. W. McC.

Preparation of aminopolypeptidase. E. ABDERHALDEN and P. GREIF (Fermentforsch., 1937, 15, 311—313; cf. Waldschmidt-Leitz and Balls, A., 1930, 957).—Hæmatite obtained by Willstätter's method when boiled with distilled H_2O for several days yields a stable material which specifically adsorbs dipeptidase (I). By this means aminopolypeptidase (II) free from (I) is obtained from intestinal mucous membrane. (II) hydrolyses *dl*-leucylglycylglycine much more rapidly than *l*-leucylglycyl-*l*-leucine (III). *l*-Leucylglycyl-*d*-leucine is more slowly hydrolysed by (II) than is (III). *l*-Leucylglycyl-*l*-tyrosine and glycylglycyl-*dl*-leucine are hydrolysed by (II). W. McC.

Polypeptidases of blood-plasma. E. ABDERHALDEN and H. HANSON (Fermentforsch., 1937, 15, 382—395; cf. Bergmann and Fruton, this vol., 97).—The polypeptidases of the serum and plasma of rabbits hydrolyse prolylpeptides [e.g., *l*-prolylglycine, glycyl-*l*-proline, m.p. 204° , non-hygroscopic (cf. Bergmann *et al.*, A., 1933, 94)]. The hydrolysis is restricted by HCN, which affects *d*-, *l*-, and *dl*-

peptides to different extents. The action of the dipeptidases is more readily inhibited by HCN than is that of the aminopolypeptidases. W. McC.

Action of gastric juice, pepsin-hydrochloric acid, trypsin-kinase, pancreatic juice, and pancreatin on proteins. E. ABDERHALDEN (Fermentforsch., 1937, 15, 314—320).—No NH_2 -acids (or traces only) are produced by the action of these enzymic preps. on proteins. W. McC.

Effect of gastric juice on diketopiperazines. E. ABDERHALDEN and F. LEINERT (Fermentforsch., 1937, 15, 324—332; cf. Shibata, A., 1934, 1260).—Histidine anhydride is hydrolysed by gastric juice and by very dil. acid. Pepsin has no effect on the rate of hydrolysis. W. McC.

Action of pepsin-hydrochloric acid, gastric juice, trypsin, and erepsin, and of the zones of hydrogen-ion concentration within which these enzymes act, on pyrrolidonecarboxylic acid and its amide. R. ABDERHALDEN (Fermentforsch., 1937, 15, 352—359).—The extent of hydrolysis of the acid and amide with production of glutamic acid and amide, respectively, is the same with pepsin, trypsin, and erepsin as with the respective amounts of HCl required to produce the $[\text{H}^+]$ at which the hydrolyses occur in presence of the enzymes. The hydrolyses are therefore not of an enzymic nature. W. McC.

Stability of defence proteinases of dried serum. E. ABDERHALDEN (Fermentforsch., 1937, 15, 321—323; cf. A., 1928, 1283).—The defence proteinases of dried serum and cerebrospinal fluid retain their activity and specificity for >9 years. W. McC.

Detection of defence proteinases in urine. E. ABDERHALDEN (Fermentforsch., 1937, 15, 348—351; cf. A., 1936, 626).—Improvements in the method are described. W. McC.

Role of specificity in the enzymic synthesis of proteins. Syntheses with intracellular enzymes. M. BERGMANN and H. FRAENKEL-CONRAT (J. Biol. Chem., 1937, 119, 707—720).—Anilides of acylated NH_2 -acids were synthesised with a prep. (I) of papain I activated by cysteine. (I) afforded the anilides of carbobenzyloxyglycine (II), m.p. 144° , benzoyl-*l*-leucine (III), m.p. 213° , $[\alpha]_D^{25} + 9.0^\circ$ in AcOH, benzoyl-*l*-phenylalanine, m.p. 219 — 220° , $[\alpha]_D^{25} + 27.6^\circ$ in $\text{C}_5\text{H}_5\text{N}$, and benzoyl-*l*-alanine, m.p. 175 — 176° , $[\alpha]_D^{25} - 8.0^\circ$ in AcOH. $\text{NHPh}\cdot\text{NH}_2$ in presence of (I) does not inhibit the enzyme but participates in the reaction, yielding, e.g., the phenylhydrazides of (II), m.p. 144° , and acetyl-*l*-phenylalanine, m.p. 205° , $[\alpha]_D^{25} - 33.5^\circ$ in $\text{C}_5\text{H}_5\text{N}$. Negative results were obtained with benzoyl-sarcosine and with free NH_2 -acids. The substrate of papain I appears to be $\text{R}\cdot\text{CO}\cdot\text{NH}\cdot\text{CHR}'\cdot\text{CO}_2\text{H}$, and the *l*-form only was acted on by the enzyme. Bromelin and cathepsin were both capable of forming the anilides of (II) and (III). J. L. C.

Chemical nature of papain. S. MAEDA (Bull. Chem. Soc. Japan, 1937, 12, 319—325).—Dialysis of an aq. solution of papain (I) greatly reduces its activity, which is subsequently increased by treatment with HCN. Pptn. with MeOH gives a gelatin-like mass which contains 3.43% of tryptophan. HCN or

PhCHO does not reactivate (I) after inactivation by N_2H_4 , $NHPh-NH_2$, NH_2OH , $NaHSO_3$, and dimethylbarbituric acid. Hence (I)-peptidase and (I)-protease contain a $\cdot CHO$. Pptd. (I) is only slowly attacked by proteolytic enzymes. Trypsin and pepsin slightly increase CO_2H , but the activity of the enzyme is unaltered. J. N. A.

Enzymic hydrolysis of glutathione by rat's kidney. E. F. SCHROEDER and G. E. WOODWARD (J. Biol. Chem., 1937, 120, 209—217).—Reduced and oxidised glutathione (I) are completely hydrolysed into their constituent NH_2 -acids by the enzyme(s) in rat's kidney. Cysteine (as sulphate) and cystine were isolated in yields of 53 and 72%, respectively. Reduced (I) titrates abnormally high by the NMe_4OH method of Linderstrom-Lang *et al.* (A., 1935, 784).

J. N. A.

Glucosulphatase. XIII. Contents of glucosulphatase and phosphatase in various invertebrates. T. SODA and S. KOYAMA (J. Chem. Soc. Japan, 1935, 56, 1338—1339; cf. A., 1936, 378).—High glucosulphatase (I) contents are recorded in sea-eel, horned top, and scallop. In many cases the (I) and phosphate contents were inversely related. The activity of (I) was high at pH 4.3 in one variety and at pH 9.3 in another; it was unrelated to the dry wt. of the organism. CH. ABS. (p)

Resistance of diketopiperazinepropionic acid to fission by proteinases.—See A., II, 390.

Amylase activity of adipose tissue. F. CEDRAN-GOLO (Atti R. Accad. Lincei, 1937, [vi], 25, 137—139).—See this vol., 269. F. O. H.

Amylase in cow's milk. G. A. RICHARDSON and C. L. HANKINSON (J. Dairy Sci., 1936, 19, 761—772).—Milk shows starch-liquefying, -dextrinising, and -saccharifying activity and is thus assumed to contain α - and β -amylase. The α -enzyme is inactivated almost completely at 55° in 30 min. whilst the β -enzyme is active after 30 min. at 65°. The optimum temp. of incubation of the two forms are: α , 30—40°; β , 50°. Milk from cows suffering from mastitis has a high but variable diastatic activity.

W. L. D.

Enzymic amylolysis. V. Action of α -amylase from malt on constituents of starch. M. SAMBO [with M. BATTISTIN] (Z. physiol. Chem., 1937, 248, 117—128; cf. A., 1936, 1298).—The rate of saccharification of the amylo-compounds of potato-starch by α -amylase from malt is > that of the erythro-compounds (I) whilst the reverse holds for saccharification with β -amylase. The greater is the concn. of (I), the earlier does the reaction cease and the smaller is the extent of saccharification. The residue from the hydrolysis of starch by β -diastase is probably derived from (I).

W. McC.

Enzymic hydrolysis of 6-halohydrin- β -D-glucosides and of related compounds.—See A., II, 399.

Activity of the phosphatase of the long bones [of rats] at various stages of growth. J. ROCHE and A. FILIPPI (Compt. rend. Soc. Biol., 1937, 125, 1064—1066).—At the end of growth the phosphatase

system of the long bones has a max. activity; differences in activity occur in the tibia and femur.

H. G. R.

Enzymes of fermentation. VII. Phosphorylation of hexoses by yeast extracts. A. SCHÄFFNER (Z. physiol. Chem., 1937, 248, 159—173).—Confirmation of previous results (A., 1935, 1026) is found in the observation that the hexose monoester fraction corresponds quantitatively with the amount of H_3PO_4 esterified during the phosphorylation of hexoses by the purified enzyme system; phosphoglyceric acid (I) is isolated as the Ba salt. A marked difference exists between induction with (I) and with hexose phosphate since the change with the former is completely inhibited by 0.0005M-NaF whilst with the latter it is scarcely affected by 0.001M-NaF. Thus regeneration of the hexose diphosphate can occur in a manner not included in the extended Meyerhof scheme, probably by direct phosphorylation by union with inorg. PO_4''' . Homogeneous cozymase has the same phosphorylating action as the crude material so that cozymase must be an essential link in phosphorylation whereas adenylic acid and co-dehydrase II are unnecessary. The "intermediate enzyme" of Warburg and Christian is not homogeneous but the apodehydrogenases (I) contained therein cannot induce phosphorylation. Preservation of the enzyme in alkaline solution causes loss of phosphorylating action without diminishing the (I). This inactive solution can regain its phosphorylating power by addition of certain enzyme solutions which are themselves inactive. (I) can be pptd. from its solution by acids and the residual solutions after admixture with the enzyme solutions inactivated by alkali induce phosphorylation. Complete activity is restored when the solution of (I) is mixed with a dialysed glycerol extract of dried yeast which does not contain (I) and alone cannot cause phosphorylation. The phosphorylation system therefore consists of at least two components, the system of (I) and the component sensitive to alkali for which the name phosphatase is retained. The latter is not identical with any known phosphatase or with phosphorylase.

H. W.

Mechanism of alcoholic fermentation. O. MEYERHOF, W. KIESSLING, and W. SCHULZ (Biochem. Z., 1937, 292, 25—67).—In the mechanism suggested by Warburg and Christian (this vol., 31), the enzymic A-protein (I) catalyses the transfer, by the adenylic acid (II) system, of PO_4''' from phosphopyruvic acid (III) to give glucose (IV) and hexose monophosphate (V) whilst the B-protein (VI) catalyses the oxidation-reduction, the uptake of inorg. PO_4''' involved in the (II) system, and all the equilibrium reactions. (V), in presence or absence of (IV), and hexose diphosphate (VII) are rapidly and completely converted into phosphoglyceric acid and $AcCO_2H$ when AsO_4''' is present; in presence of (VI), but not of (I), the change does not proceed beyond (III) or (V), respectively. (V) is invariably the first product of phosphorylation and is an essential intermediate.

W. McC.

Isolation of pure cozymase from the muscle of warm-blooded animals. S. OCHOA (Biochem. Z., 1937, 292, 68—73).—Cozymase, identical with that of yeast, is obtained in 0.06% yield from fresh rabbit's

muscle by a modification of the procedure of Meyerhof and Ohlmeyer (this vol., 313). W. McC.

Pyrophosphatase. II. Mechanism of activation of phosphatases. E. BAUER (Z. physiol. Chem., 1937, 248, 213—226; cf. A., 1936, 896).—Pyrophosphate (I) is not hydrolysed by pyrophosphatase (II) from bottom yeast in the absence of Mg [which probably activates (I)], a (I)–(II) compound being subsequently produced. The extent of action of (II) \propto [Mg] and to the amount of (II), and varies also with [(I)]. The amount of Mg required for optimal action depends on p_H , the optimal p_H shifting to the alkaline side as [(I)] increases. The action of (II) is inhibited by NaF but the effect can be reversed by increasing [Mg] and substrate concn. $CaCl_2$ and adenosinetriphosphoric acid also inhibit the action of (II), the effect of $CaCl_2$ being reversed by increasing [Mg]. W. McC.

Production of phosphoglyceric acid. P. OSTERN and A. J. GUTHKE (Z. physiol. Chem., 1937, 248, 155—158).—The method of Neuberg and Kobel (A., 1934, 56) succeeds only when the yeast is fermenting vigorously before PhMe is added. Addition of hexose diphosphate is unnecessary and a yield of 70 g. of Ba phosphoglycerate is obtained from 1225 c.c. of 40% aq. glucose. W. McC.

By-products in the preparation of cozymase from yeast. F. SCHLENCK and W. GLEIM (Svensk Kem. Tidskr., 1937, 49, 181—184).—Adenylic acid and codehydrogenase II (triphosphopyridine nucleotide) have been obtained. M. H. M. A.

Biocatalysts of yeast. G. MEDVEDEV and N. S. VISSOTZKAJA (Fermentforsch., 1937, 15, 257—263).—The amount of biocatalysts which must be added to yeast in order to produce a given abs. rate of fermentation \propto the amount of living yeast used. Preps. containing biocatalysts should be compared on the basis of the no. of mg. which cause liberation of 5 mg. of CO_2 in 1 min. at 30° when 1 g. of yeast is used. Added biocatalysts act only after passing into the living yeast cells where production of complexes occurs. During fermentation, the complexes pass out into the surrounding medium. W. McC.

Effect of crystalline hormones on the growth of yeasts. A. P. WEBER (Ann. Ferm., 1937, 3, 15—29, 65—86).—The growth (rate of formation of dry matter) of *Rhodotorula sugari* and of *R. glutinis*, var. *Saitoi*, is stimulated by folliculin, dihydrofolliculin benzoate, or testosterone at a concn. of 0.0001%, the activity depending on the rate of growth. The effect of androsterone, insulin, thyroxine, or heteroauxin is less marked, whilst adrenaline shows no action. The activity of the hormones is small in the absence of Zn and is augmented by addition of Th, Mn, Cu, I, and B. Other yeasts examined were not affected by the hormones. H. G. R.

Factors influencing radiosensitivity. G. HARKER (J. Cancer Res. Comm. Sydney, 1937, 8, 14—23; cf. A., 1936, 523).—Addition of 0.1—1.0% of KCl, $KHCO_3$, KI, or $MgCl_2$ increases the invertase action of yeast preps. whilst the subsequent effect of Ra irradiation is inhibited by 10—60%; $CaCl_2$ is without action on either phase. Data for the direct action of

added inorg. and org. salts and their mixtures are given; Na succinate strongly inhibits. The bearing of the results on the efficacy of irradiation of tumours is discussed. F. O. H.

Toxic action of substances which give rise to hydrochloric acid on hydrolysis. H. MAGNE and P. RÉMY (Bull. Soc. Chim. biol., 1937, 19, 1092—1104).—The reproduction of yeast is much more sensitive than the respiration and fermentation to small concns. of $(C_2H_4Cl)_2S$ (I) and trichloroethylamine (II). The hydrolysis products thiodiglycol, $N(C_2H_4OH)_3$, and HCl are practically non-toxic. The toxic action of (I) and (II) is related to their intracellular hydrolysis and not to the extracellular hydrolysis products. P. W. C.

Effect of cysteine on respiration and fermentation of bakers' yeast. J. RUNNSTRÖM, A. RUNNSTRÖM, and E. SPERBER (Naturwiss., 1937, 25, 540).—The addition of a small amount of cysteine (I) to yeast causes no change in its characteristic respiration, but the aerobic changes occurring after addition of glucose are entirely altered. Respiration decreases considerably, but there is strong aerobic fermentation. Addition of (I) does not accelerate and possibly retards anaerobic fermentation. Aerobic fermentation also increases after addition of thioglycollic acid. When F' and glucose were added simultaneously with (I) to yeast under anaerobic conditions, fermentation ceased. Under aerobic conditions F' exerted no influence. A. J. M.

Processes in the synthesis of yeast cell-substance. Assimilation of nitrogen from amino-acids by yeast.—See B., 1937, 965.

Polysaccharide synthesis in the yeast cell. K. F. BONHOEFFER and G. GÜNTHER (Naturwiss., 1937, 25, 459).—When yeast is grown on a medium containing 50% of D_2O , the polysaccharides formed contain a quantity of D which depends on the type of sugar present in the medium. Thus the glycogen (I) fraction contained 8.3, 8.6, and 4.5% of D according as to whether the sugar employed was glucose (II), mannose (III), or fructose (IV). The smaller D content when (IV) was used suggests that the synthesis of (I) from this sugar is more direct than that from (II) or (III). W. O. K.

Zymosterol and ascosterol.—See A., II, 416.

New species of yeast of the genus *Zygosaccharomyces*: *Z. Ashbyii*. M. CORDOC'H (Ann. Ferm., 1937, 3, 87—104).—The yeast, which is probably a variety of *Z. Marxianus*, has been isolated from diseased sisal. Biochemical characteristics are recorded. H. G. R.

New black-pigmented species of *Torula* [*T. schænii*]. N. ROUCHELMAN (Ann. Ferm., 1937, 3, 149—155).—A more detailed account of work already reviewed (this vol., 143). H. W.

Capsules of *Mycotorula albicans* and other yeast-like fungi. P. NEGRONI (Folia biol., 1935, 1, 235—236).—A sp. polysaccharide isolated from the capsules was sol. in H_2O , acted as a hapten, and did not cause formation of antibodies when injected into animals. It gave a complement fixation reaction

with serum of rabbits immunised with the whole organisms, and a precipitin reaction with certain immune sera. CH. ABS. (p)

Mathematical expression of the growth of *Aspergillus niger* as a function of the magnesium concentration of the medium. J. LAVOLLAY and (MME.) F. LABOREY (Compt. rend., 1937, 204, 1686—1687).—The yield of *A. niger* depends on the [Mg] in the medium and not on its abs. amount. 1.05 mg. of Mg per 100 c.c. of Raulin's medium leads to max. development. J. L. D.

Protein from *Aspergillus niger*. P. DIATSCHENKO (Trud. Lab. Izuch. Belko Obm. Organ., 1935, No. 8, 30—35).—The "proto-acid" is prepared by Perov's method (A., 1936, 1037). The N content of various protein preps. (not obtained pure) was 12.25—15.27%. CH. ABS. (p)

Toxins of *Fusarium bucharicum*, Jacz, and *F. graminearum*, Schw. S. MEDVEDEVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 503—508).—When *F. bucharicum* and *F. graminearum* are grown on modified Richard medium of p_H 5.27 the latter develops a more alkaline reaction (p_H 6.97 and 6.48, respectively) and contains NH_3 (21.74 and 19.73 mg., respectively, per 100 c.c.). The culture fluids, after removal of the fungi contained a toxin, apparently thermo-stable. Methods for the detection of the latter are described. W. O. K.

Gas requirements of *Penicillium Roquefortii*.—See B., 1937, 972.

Antagonistic action of *Trichoderma* on *Actinomyces scabies* and *Rhizoctonia solani*. R. H. DAINES (Amer. Potato J., 1937, 14, 85—93).—*T. lignorum* produces a diffusible substance which is toxic to *A. scabies* and to *R. solani*. The substance is destroyed by aeration of the soil, and may be absorbed by C. A soil bacterium produces a substance which is toxic to *T. lignorum* and to *A. scabies*. A. G. P.

Growth factor influencing the development of *Ophiobolus graminis*, Sacc. G. W. PADWICK (Sci. Agric., 1936, 16, 365—372).—An essential growth factor for the organism occurs in certain plant and animal extracts (carrots, casein) and in certain bacterial cultures. A. G. P.

Nutrition of flagellates—Tetramitidæ. Sterols as growth factors for *Trichomonas*. R. CAILLEAU (Ann. Inst. Pasteur, 1937, 59, 137—172).—A study of the conditions of multiplication of *Eutrichomastix colubrurum*, *T. fetus*, and *T. columbæ*. Cholesterol is essential for the growth of *T. columbæ*. E. M. W.

Doctrine of pleomorphism in bacteriology. S. WINOGRADSKY (Soil Sci., 1937, 43, 327—340).—A crit. review. A. G. P.

Micro-organisms and vitamins. S. ORLA-JENSEN (Ann. Ferm., 1937, 3, 1—14).—Lactic bacteria require an activator similar to bios (I) and lactoflavin (II) for their development. A method for comparative determination of these substances in media is described. Peptone contains (II) and small quantities of (I). H. G. R.

Acetone-butyl alcohol fermentation. A. JANKE and V. SIEDLER (Biochem. Z., 1937, 292, 101—115).—In the mixture produced by addition of *B. acetobutylicus* to glucose fermented by aq. extract of yeast, addition of MeCHO increases the ratio BuOH : COMe₂ from 1.7 : 1 to 4.7 : 1 and from 2.9 : 1 to 22 : 1 if CaCO₃ is also added. When suspensions, p_H 6.0, of the washed bacilli are used, no COMe₂ but equimol. amounts of BuOH and PrCO₂H and of EtOH and AcOH are produced. Hence production of COMe₂ and that of BuOH are not interdependent. PrCO₂H is produced but not COMe₂ or BuOH when aldol, which does not kill the bacillus, is added to the suspension at p_H 6.3. The suspension produces no COMe₂ or BuOH from added AcOH. Aldol is possibly an intermediate in production of COMe₂ and BuOH but production of COMe₂ from AcOH or of BuOH from PrCO₂H or aldol in the suspensions is thermodynamically improbable. W. MCC.

Occurrence of phosphoglyceric acid in bacterial dissimilation of glucose. R. W. STONE and C. H. WERKMAN (Biochem. J., 1937, 31, 1516—1523).—All the organisms investigated, except the strict anaerobes (e.g., *Clostridium*), grown in media containing glucose and hexose diphosphate, yield glycerophosphoric acid (I). The formation is accelerated by aëration and retarded by storage at 5°. Optimum conditions include the presence of a H acceptor appropriate to the organism, e.g., CHAcMe·OH for the colon-*aërogenes* group and AcCO₂H for propionic bacteria. The rôle of (I) in bacterial glycolysis is discussed. F. O. H.

Action of *B. coli* on conjugated bile acids. K. P. BASU and S. C. CHAKRAVARTY (Indian J. Med. Res., 1934, 21, 691—694).—When Na taurocholate (I) is incubated at 37° with a suspension of *B. coli* in PO₄''' buffer at p_H 6.8 or 8.03, no hydrolysis of (I) occurs, but at p_H 8.03 a small quantity appears to be destroyed. W. O. K.

Adaptability of glucosylase and galactosylase in *Bacterium coli*. M. STEPHENSON and E. F. GALE (Biochem. J., 1937, 31, 1311—1315).—The rate of glycolysis ($Q_{glucose}$) with washed suspensions of *B. coli* is approx. doubled by changing from highly aerobic to anaerobic growth conditions, the increase being obtained on addition of 1% glucose (I) or galactose (II) to the growth medium. (II) ferments at an extremely low rate and this is not raised by addition of (I) but is increased 40-fold on adding 1% of (II) to the medium. The increase is not attained when (I) and (II) are simultaneously present. Adaptation to (II) is invariably accompanied by growth; increase in $Q_{galactose} \propto$ the no. of cells which have multiplied in presence of the sp. substrate. P. W. C.

Factors influencing bacterial deamination. I. Deamination of glycine, *dl*-alanine, and *l*-glutamic acid by *Bacterium coli*. M. STEPHENSON and E. F. GALE (Biochem. J., 1937, 31, 1316—1322).—The chief effect of glucose on the oxidative deamination of glycine (I), *dl*-alanine (II), and *l*-glutamic acid (III) is to inhibit formation of deaminase (IV) during growth. With one strain of *B. coli* the inhibition amounted to 95% for all three acids. It is

not due to anaërobiosis arising during fermentation nor to change of p_H since these were controlled. Anaërobic conditions during growth also inhibit (IV) formation with (I) and (II) but favour it with (III). Presence of the sp. NH_2 -acid in the growth medium does not affect formation of (IV) and age of culture between 8 and 20 hr. has only a slight effect.

P. W. C.

Toxin of *Bacterium coli*. I. A. LIGAS (Boll. Soc. ital. Biol. sperim., 1937, 12, 141—143).—Intravenous injection of various fractions into rabbits indicates the following order of decreasing toxicity: exotoxin + autolytic products, polysaccharides (I) extracted from the bacteria (endotoxin), dead bacteria, dead bacteria deprived of (I).

F. O. H.

Fermentation of glucose by bacteria of the *coli-aërogenes* group. D. R. CANEPA and C. S. DE LA SERNA (Folia biol., 1935, 1, 238—243).—*Escherichia coli*, *Aërobacter aërogenes*, and intermediate forms all produce CO_2 , H_2 , EtOH, CH_3CO_2H , $(OH\cdot CHMe)_2$, HCO_2H , AcOH, lactic and succinic acids from glucose but the relative proportions of these products are different for each species. A means of identification is thus possible.

CH. ABS. (p)

Proteinase of *Clostridium histolyticum*. L. WEIL and W. KOCHOLATY (Biochem. J., 1937, 31, 1255—1267).—Studies of proteinase activity were made on bacteria-free filtrates of anaërobic cultures. The enzyme is extracellular and shows a p_H optimum of 7. It is not activated by enterokinase, but is activated by $\cdot SH$ compounds. Heavy metals catalyse the activation. Maximum activation by cysteine- Fe^{++} occurred under anaërobic conditions. The active group of the proteinase does not appear to be SH . Addition of an activator to dialysed preps. gives an increase in activity which is independent of the purity of the prep. or variations in substrate or in the composition of the culture medium. The proteinase activity of cultures increased with growth of the organisms, reaching a max. after 24 hr., and then decreasing.

J. L. C.

Chemical influences of bacteria on blood-pigments. M. KUROVA (Trans. 9th Congr. Far East Assoc. Trop. Med., 1934, 1, 311—320).—Hæmatin (I) was produced by cholera or H_2O vibrios. Under aërobic conditions oxyhæmoglobin was changed into (I) and methæmoglobin.

CH. ABS. (p)

Favourable effect of yeasts on the utilisation of carbohydrates and production of toxin by the diphtheria bacillus. P. BORDET (Compt. rend. Soc. Biol., 1937, 125, 1044—1046).—Addition of baker's yeast to the medium augments production of the toxin by reason of increased utilisation of carbohydrates.

H. G. R.

***Corynebacterium diphtheriæ*.** M. T. CASASSA (Patologica, 1935, 27, 726—737).—Growth of the organism in various media is examined. All media, initially at p_H 7.0—7.2, became acid (p_H 6.0—6.8) within 24 hr. Different strains behaved differently towards sugars. Toxin production was favoured by aërobic conditions and p_H near 7, and was least in organisms showing the greatest tendency to acidify the substrate.

CH. ABS. (p)

Porphyrin of toxic diphtheria broth. M. PAIO (Ann. Inst. Pasteur, 1937, 59, 197—206).—The absorption spectrum of broth containing diphtheria toxin can be reproduced by a mixture of coproporphyrin (I) and broth, showing (I) to be the characteristic constituent.

E. M. W.

Nicotinic acid as growth accessory for diphtheria bacillus. J. H. MUELLER (J. Biol. Chem., 1937, 120, 219—224).—The isolation of $3.3 \times 10^{-6}\%$ of nicotinic acid (I) from liver is described. (I) exerts its max. effect on the growth of *B. diphtheriæ* when present in a concn. of about $1 \times 10^{-4}\%$, and is approx. ten times as effective as nicotinamide.

J. N. A.

Physiological rôle of hæmin for *Hæmophilus influenzae*, Pfeiffer. A. LWOFF and M. LWOFF (Ann. Inst. Pasteur, 1937, 59, 129—136).—The O_2 consumption of *H. influenzae* near the min. dose of hæmin (I) permitting growth \propto (I) concn. Hence (I) is a necessary constituent of a respiratory enzyme system.

E. M. W.

Influence of hydrogen-ion and lactic acid concentration on the growth of *Bacillus putrificus*. H. HOSTETTLER and E. ZOLLIKOFER (Z. physiol. Chem., 1937, 248, 183—196).—Addition of lactic acid (I) hinders the development of *B. putrificus verrucosus*, Zeissler, both through H and undissociated acid mols. In absence of (I) the tolerated $[H^+]$ depends on the nature and properties of the culture medium, the lowest p_H val. being observed in the presence of glucose. The different races of bacteria show varying sensitiveness towards $[H^+]$ according to the culture medium. The inhibitory action of undissociated (I) is observed at a concn. of $1.5 \times 10^{-5}N$ and the fatal concn. in the cases of five races is 4.19×10^{-3} , 3.48×10^{-3} , 3.64×10^{-3} , 3.15×10^{-3} and $2.89 \times 10^{-3}N$. It is const. for each race with a given culture medium. In absence of (I) the temp. (25° or 37°) of cultivation is without influence on the growth of the organism. In the series with addition of (I) the limiting p_H vals. at 25° are $>$ at 37° . At 25° (I) inhibits $>$ at 37° . The lethal concn. of (I) depends on the culture medium.

H. W.

Chemotherapy of pneumococcal infection by di-(*p*-acetamidophenyl)sulphone (1399F). E. FOURNEAU, J. TRÉFOUËL, (MME.) J. TRÉFOUËL, F. NITTI, and D. BOVET (Compt. rend., 1937, 205, 299—300; cf. this vol., 359).—(*p*-NHAc-C₆H₄)₂SO₂ (I) has 10 times the antistreptococcal activity of *p*-NH₂-C₆H₄-SO₂-NH₂ (II), about the same as (*p*-NO₂-C₆H₄)₂SO₂ and $<$ (*p*-NH₂-C₆H₄)₂SO₂. The antipneumococcal activity of (I) is 10 times that of (II) and it is effective against different strains of bacilli.

J. L. D.

Phenol-resistance of *Staphylococcus aureus*. E. E. VICHER, E. MEYER, and E. N. GATHERCOAL (J. Amer. Pharm. Assoc., 1937, 26, 590—593).—Various strains of *S. aureus* show marked differences in their resistance to PhOH and also day-to-day variations in the resistance of individual strains.

F. O. H.

Spectrographic identification of nicotinic acid in *Staphylococcus aureus* growth factor concentrates. E. R. HOLIDAY (Biochem. J., 1937, 31,

1299—1302).—The absorption spectrum of a *S. aureus* growth factor concentrate is measured in 0.1N-HCl and -NaOH and compared with those of C_5H_5N , 3-cyanopyridine, nicotinic acid (I), and nicotinamide and the presence of (I) in the concentrate deduced. From the increase in extinction coeff. on acidifying an alkaline solution of concentrate as compared with that for a solution of pure (I), the amount of (I) in the concentrate is estimated as 1.47%. P. W. C.

Culture of mastitis streptococci from milk. IV. **Selective media.** M. KLIMMER and G. WEISKE (Milch. Forsch., 1937, 19, 15—22; cf. B., 1937, 489).—A sucrose-albuminate-bromocresol-purple agar medium is best for separation on plates from high-count milk. Small colonies with cloudy edges, dark yellow ring, and dark centres are identified by being Gram-positive and growing in methylene-blue- and litmus-milk. Some indications of further selectivity were obtained by adding Me-violet or NaN_3 to the medium. W. L. D.

Antistreptococcal action of organic sulphides. P. GLEY (Compt. rend., 1937, 204, 1907—1908; cf. Buttle *et al.*, this vol., 302).— p -NHAc- C_6H_4 ·SO₂H has an antistreptococcal activity in mice < that of carboxysulphamidochrysoidine (I) whilst the activity of p -NHAc- C_6H_4 ·SH is about equal to that of (I). J. L. D.

Action of organic salts on the development of the bovine type of tubercle bacilli. A. ROSA and R. MACCOLINI (Boll. Soc. ital. Biol. sperim., 1937, 12, 183—184).—Neutralisation of the N-NaOH used in the prep. of the cultures of the bacillus by AcOH significantly retards subsequent growth. This does not occur with the human type, or with the bovine type when lactic acid is used. F. O. H.

Cellular reactions to wax-like materials from acid-fast bacteria. Unsaponifiable fraction from the tubercle bacillus, strain H-37. F. R. SABIN, K. C. SMITHBURN, and R. M. THOMAS (J. Exp. Med., 1935, 62, 751—769).—The unsaponifiable fraction stimulates blood cells, causing formation of new monocytes which surround the wax-like particles and then fuse into giant cells within which the waxes slowly disintegrate without damage to the cells. CH. ABS. (p)

Chemical nature of the hapten-lipoid stabiliser of tubercle bacilli. Chemistry of the purified active fraction. M. A. MACHEBŒUF, G. LÉVY, and M. FAURE (Compt. rend., 1937, 204, 1843—1845; cf. A., 1927, 1114).—Treatment of the active fraction (cf. A., 1935, 899) dissolved in NaCl with Et₂O-COMe₂ or EtOH affords a ppt. with alexic properties but which is contaminated with a polyside and when hydrolysed gives rather >2% of reducing sugar (cf. this vol., 36). The phosphatide acids (I) in the fraction occur mainly as Mg salts with some Ca and Na. (I) decompose in the free state and the hapten activity diminishes and disappears. With N-H₂SO₄ at room temp. the fraction gives saturated fatty acids but no free H₃PO₄, which is linked to the polyhydric alcohols. Controlled hydrolysis with Ba(OH)₂ at 100° yields a mixture of Ba salts of inositol-, and glycerophosphoric acids. The free acids are hydro-

lysed by H₂O at 134° under pressure. One of the Ba salts contains P and inositol. J. L. D.

Chaulmoogra oil and morphological modifications of *Mycobacterium tuberculosis*. F. BAL-SAMELLI (Boll. soc. intern. microbiol. Sez. ital., 1935, 7, 341—343).—The ethylated oil has a sp. action on the organism, modifying its resistance to acids and favouring granular decomp. CH. ABS. (p)

Polysaccharide of the typhus bacillus. VI. **Toxic action.** A. SPANEDDA (Boll. Soc. ital. Biol. sperim., 1937, 12, 143—144; cf. A., 1936, 1010).—The symptoms of toxic action in rabbits and guinea-pigs (lethal dose 2 and 5 mg. per kg., respectively) are described. F. O. H.

Chemical and physical factors causing bacteriolysis. A. C. H. YEN (Trans. 9th Congr. Far East Assoc. Trop. Med., 1934, 1, 303—309).—The action of electricity on bacterial suspensions results from the effect of substances produced by electrolysis. Bacteriolysis occurs only when OCl', OBr', or OI' is formed. Acids or hydroxides formed by electrolysis accumulate in too small concn. to cause lysis. CH. ABS. (p)

Determination of the size of the bacteriolysins of *Actinomyces* by ultrafiltration. M. WELSCH and W. J. ELFORD (Compt. rend. Soc. Biol., 1937, 125, 1053—1056).—The diameter of the bacteriolysins is 4.4—5.2 μ . H. G. R.

Bacteriolytic action of menthol. G. PACHECO and M. PARA (Compt. rend. Soc. Biol., 1937, 125, 1099—1100).—Menthol at low concns. has a bacteriolytic action which is reduced by lecithin. H. G. R.

Virus in the ætiology of rheumatic diseases. G. H. EAGLES, P. R. EVANS, A. G. T. FISHER, and J. D. KEITH (Lancet, 1937, 233, 421—429).—Sera from patients with rheumatic fever, chorea, and rheumatoid arthritis agglutinate suspensions from the corresponding disease. Cross-agglutination occurring within the whole group indicates a similar virus ætiology for all three diseases. L. S. T.

Fluorescence microscopy on living virus with oblique incident illumination. F. HIMMELWEIT (Lancet, 1937, 233, 444—445).—The technique demonstrates, by the fluorescence of primulin or Titan-yellow 2GS, the elementary bodies of living viruses in the cells of living, infected tissue. L. S. T.

Isolation and some properties of liquid crystalline substances from solanaceous plants infected with three strains of tobacco mosaic virus. F. C. BAWDEN and N. W. PIRIE (Proc. Roy. Soc., 1937, B, 123, 274—320).—Infective nucleoproteins exhibiting characteristic optical properties were isolated from solanaceous plants infected with three strains of tobacco mosaic virus, but not from healthy plants. Solutions of the proteins (>2%) separate into two layers: the lower layer is more conc. and is birefringent; the upper layer shows anisotropy. The activity per unit solid content is the same for both layers. Effects of certain chemicals on activity, and the stability of the nucleic acid-protein complex to heat and drying, are examined.

In purified preps. the complex exists as rod-shaped particles formed by linear aggregation of constituent units. In the plant the particles are probably not completely aggregated. A. G. P.

Isolation of high-molecular proteins by the ultracentrifuge. R. W. G. WYCKOFF (Naturwiss., 1937, 25, 481—483).—The crystallisation, directly from the crude sap, of the virus of the tobacco mosaic disease (mol. wt. 17×10^6) is effected by differential centrifugation. Less stable plant viruses, which cannot be crystallised by other methods, when purified in this way, proved to be cryst. proteins of similar mol. wt. Similarly the virus of rabbit papillomatosis has been isolated as a protein of mol. wt. 25×10^6 . W. O. K.

Orange-juice for the aerobic culture of anaerobic bacteria. V. CIANCI and C. PALMIERI (Boll. Soc. ital. Biol. sperim., 1937, 12, 110—113).—Orange-juice gives results superior to those due to using equiv. amounts of vitamin-C. F. O. H.

Chemotherapy. F. L. PYMAN (Chem. and Ind., 1937, 789—794).—Recent work on bactericides and amœbicides is reviewed. Investigation of the activity of a large no. of alkylharmols led to the view that the harmol residue might not be an important contributor to amœbicidal properties. Attachment of the group $\text{NBu}_2[\text{CH}_2]_{10}$ to a substituted NH_2 gave high activity. The min. amœbicidal concn. of a long series of paraffins $\text{NRR}'[\text{CH}_2]_n\text{NRR}'$ was determined. Of the series $\text{NR}_2[\text{CH}_2]_{10}\text{NR}_2$, α -tetra-*n*-amyldiaminodecane had only 0.1 of the toxicity of emetine to mice when given orally and $\frac{1}{8}$ when given subcutaneously and was 3—5 times as efficient in tests *in vitro*, but was not sufficiently active in man in amœbic dysentery to be of any real val. P. W. C.

Oligodynamic action of silver. H. FROMHERZ and J. HEISS (Angew. Chem., 1937, 50, 679—681).—The effects of the presence of pure and treated Ag wire in cultures of *Staphylococcus aureus* show that the bactericidal action depends on the presence of Ag^+ ($< 2 \times 10^{-11}$ mol. per litre) which have their origin in Ag salts present as impurities or in the oxidised surface film. S. M.

Hormones as physiological stimulants. H. FITTING (Biol. Zentr., 1936, 56, 69—86; Chem. Zentr., 1936, i, 3706).—A lecture. A. G. P.

Osteodystrophy and hormone influence. J. MARX (Orvosi Het., 1935, 79, 1262—1264).—Thymus and spleen as well as the secondary thyroid gland are concerned in Ca metabolism. Increased calcification caused by artificial hyperfunction of the secondary thyroid was not prevented by simultaneous administration of spleen and thymus preps.

CH. ABS. (*p*)

Influence of adrenaline on resorption from subcutaneous tissues. J. FALCK and E. LANGZ (Klin. Woch., 1935, 14, 1209—1211; Chem. Zentr., 1936, i, 3708).—Addition of adrenaline (I) inhibits the resorption of subcutaneously administered MgSO_4 . No such effect occurs if (I) is injected simultaneously with MgSO_4 but in other tissues. Sympatol has no action on Mg resorption. A. G. P.

Comparative effect of adrenaline and of glucose on the utilisation of sugar by the muscles, determined with the aid of thermostromuhr measurements of blood flow. S. SOSKIN, H. E. ESSEX, J. F. HERRICK, and F. C. MANN (Amer. J. Physiol., 1937, 118, 328—332).—Continuous intravenous injection of adrenaline in the dog appears to have no effect on sugar utilisation. R. N. C.

Lachrymal elimination of glucose during adrenaline hyperglycæmia. D. MICHAEL, P. VAN-CEA, and N. ZOLOG (Compt. rend. Soc. Biol., 1937, 125, 1095—1096).—Excretion of glucose in the tears commences when the blood-sugar is increased by 30—40%. H. G. R.

Adrenaline content of the adrenal glands.
I. Determination in small laboratory animals.
II. Determination in rabbits and dogs killed by slow and rapid hæmorrhage, traumatic destruction of the medulla [oblongata], and gaseous emboli.
III. Content in rabbits anæsthetised or killed with ether or chloroform.
IV. Content in rabbits poisoned with phosphorus or strychnine.
V. Determination in animals after fatal insulin shock, combined action of insulin and atropine, or anaphylactic shock. F. MARCONI and I. DI MARCO (Boll. Soc. ital. Biol. sperim., 1937, 12, 164—165, 165—166, 166—168, 168—169, 169—170).—I. Weller's method (A., 1934, 332) indicates an adrenaline (I) content of 1.312 (per g.), 0.176 (total), and 0.119 mg. (total) in the glands of dogs, rabbits, and guinea-pigs, respectively.

II. Death due to air emboli or slow hæmorrhage results in a very low content of (I). Rapid hæmorrhage or destruction of the medulla oblongata has little effect.

III. Et_2O narcosis produces little change whilst CHCl_3 narcosis (especially when lethal) diminishes the (I) content.

IV. With both forms of poisoning, the (I) content is reduced to zero vals.

V. Large doses of insulin, with or without atropine, produce an almost complete disappearance of (I) from the glands of dogs and rabbits. Anaphylactic shock (horse serum) in guinea-pigs has little effect on the (I) content. F. O. H.

Cytology of the adrenal. F. F. MCKENZIE and L. J. NAHM (Ann. Rept. Montana Agric. Exp. Sta. Bull. [1933], 1934, No. 340, 13).—Changes in the fat and mitochondrial content of cortical cells during the œstrous cycle involved variation in the no. and size of fat globules in the glomerular zone. The fat content increased in pro-œstrus and early œstrus, reaching a max. in early metœstrus and decreasing throughout diœstrum. Changes in the fat content of cells of the zona fasciculata and zona reticularis closely paralleled the above. CH. ABS. (*p*)

Sodium chloride balance in the adrenalectomised opossum. S. W. BRITTON and H. SILVETTE (Amer. J. Physiol., 1937, 118, 21—25).—Serum-Na and -Cl are definitely increased in adrenal insufficiency in the fasting state, whereas in the higher mammalian species they fall. Administration of H_2O causes falls

in the Na and Cl levels, which are augmented in lactation or diarrhoea. Serum-sugar and liver- and muscle-glycogen are decreased. R. N. C.

Maintenance of adrenalectomised dogs without cortin through control of the mineral constituents of the diet. W. D. ALLERS and E. C. KENDALL (Amer. J. Physiol., 1937, 118, 87—94).—Administration of NaCl and Na citrate with the diet results in survival for long periods. R. N. C.

Effect of cortin on the concentrations of some constituents of the blood of adrenalectomised rats. D. J. INGLE, H. W. NILSON, and E. C. KENDALL (Amer. J. Physiol., 1937, 118, 302—308).—Cortin (I) does not prevent the increase in blood-urea after nephrectomy, or alter Na and Cl from their normal vals. Blood-sugar is slightly decreased, whilst serum-K is increased, the increase being associated with loss of muscular activity. (I) retards the increase of K in adrenalectomised animals injected intraperitoneally with H₂O, but does not affect the increase of urea or the fall of Na and Cl which result from such injections. R. N. C.

Effects of administering adrenotropic extract to hypophysectomised and thyroidectomised tadpoles. W. J. ATWELL (Amer. J. Physiol., 1937, 118, 452—456). R. N. C.

Comparison of sodium, chloride, and carbohydrate changes in adrenal insufficiency and other experimental conditions. S. W. BRITTON and H. SILVETTE (Amer. J. Physiol., 1937, 118, 594—599).—Cats subjected to removal of adrenals, pancreas, or kidneys, different combinations of these, or intraperitoneal tissue transplants show decreases in serum-Na and -Cl, in some cases considerably > in adrenal insufficiency. The Na/Cl loss ratio is < normal, whereas in adrenal insufficiency it shows the normal val. Adrenalectomy causes falls of serum-sugar (I) and total carbohydrate of the body, but the other operations cause considerable increases of (I). R. N. C.

Cortico-adrenal insufficiency: metabolism studies on potassium, sodium, and chloride. H. W. NILSON (Amer. J. Physiol., 1937, 118, 620—631).—Adrenalectomised dogs on a diet low in K and high in NaCl and Na citrate require no cortical extract (I), but the positive balance of Na and Cl must be > that required by intact animals, and a uniform daily balance cannot be maintained. A high intake of K and a low intake of Na and Cl produce similar symptoms of adrenal insufficiency, which are associated with a high K level in the cells; blood-K returns to its normal levels on administration of (I) and/or Na. Blood-urea is sometimes increased in adrenal insufficiency, and there are changes in blood-sugar, Na, Cl, and the hæmatocrit val., but only the increase in K is characteristic. R. N. C.

Effects of cortico-adrenal extract on growth and sexual activities. O. G. FITZHUGH (Amer. J. Physiol., 1937, 118, 677—689). R. N. C.

(A) Effect of cortin on the sodium, potassium, chloride, inorganic phosphorus, and total nitrogen balance in normal subjects and in patients

with Addison's disease. (B) Effect of cortin on renal excretion of sodium, potassium, chloride, inorganic phosphorus, and total nitrogen in normal subjects and in patients with Addison's disease. G. W. THORN, H. R. GARBUTT, F. A. HITCHCOCK, and F. A. HARTMAN (Endocrinol., 1937, 21, 202—212, 213—219).—(A) Subcutaneous injections of 12—18 cat units of cortin per day produced no significant change in Na, K, and Cl balances in normal subjects. In patients with severe Addison's disease injection of 20 units daily changed the Na and Cl balances from negative to positive.

(B) Large intravenous injections (80 cat units) of cortin reduced the hourly excretion of Na and increased that of K in normal subjects and in patients with Addison's disease. There was no significant effect on the excretion of inorg. P or N. J. L. C.

Importance of cortico-adrenal regulation of potassium metabolism. R. L. ZWEMER and R. TRUSZKOWSKI (Endocrinol., 1937, 21, 40—49).—The level of plasma-K is actually raised by adrenalectomy, whilst K tolerance is lowered and administration of normal amounts of K causes marked symptoms. Injection of K salts into normal animals raises the blood-K and may produce similar symptoms. Injection of adrenal cortex extract lowers the blood-K of normal animals and protects against large amounts of K given intraperitoneally. M. A. B.

Cortico-adrenal and neural effects on gonadotropic activity of the pituitary. H. B. FRIEDGOOD (Science, 1937, 86, 84—85).—In cats the adrenal glands are essential for the proper coital stimulation of the anterior pituitary. The time, >1 hr., between mating and the gonadotropic response of the pituitary is consumed in the secretion, and possibly elaboration, of an adrenal cortical hormone, which can stimulate the gonadotropic activity of the anterior pituitary. L. S. T.

Effect of adrenalectomy and thyroidectomy on ketonuria and liver-fat content of the albino rat following injections of anterior pituitary extract. E. G. FRY (Endocrinol., 1937, 21, 283—291).—Adrenalectomy following the injection of anterior pituitary extract suppressed the excretion of ketones and prevented fatty infiltration of the liver. The ketogenic response to the extract was permitted by the presence of adrenal cortical tissue but not by adrenal cortical extract therapy, and remained after thyroidectomy. J. L. C.

Effect of adrenalectomy on the ketosis of fasting and on the action of the anterior pituitary ketogenic principle. E. M. MACKAY and R. H. BARNES (Amer. J. Physiol., 1937, 118, 184—189).—Fasting ketosis in rats is reduced by bilateral adrenalectomy; ketosis caused by anterior pituitary extracts is abolished or reduced. (Cf. A., 1936, 1542.) R. N. C.

Effect of adrenalectomy on liver-fat in fasting and after the administration of anterior pituitary extracts. E. M. MACKAY and R. H. BARNES (Amer. J. Physiol., 1937, 118, 525—527).—Ketogenic anterior pituitary extracts cause deposition of fat in the livers of fasting rats. Adrenalectomy abolishes both

ketogenesis and fat deposition, and also reduces the amount of fat deposited in the liver during fasting.

R. N. C.

Carbohydrate metabolism of hypophysectomised and hypophyso-adrenalectomised rats. E. L. COREY and S. W. BRITTON (Amer. J. Physiol., 1937, 118, 15—20).—Blood-sugar (I) rises for 30—40 days after complete hypophysectomy, and in long-surviving animals subsequently falls below normal. The changes are independent of wt. changes and the survival period. Liver- and muscle-glycogen (II) vary within normal limits. Adrenalectomy following hypophysectomy causes rapid falls in (I) and (II). Carbohydrate changes in the chronic state following hypophysectomy may be due in part to changes in the adrenal cortex.

R. N. C.

Cortex- and medulla-stimulating action of the anterior lobe of the pituitary gland. A. W. ELMER, B. GIEDOSZ, and M. SCHEPS (Compt. rend. Soc. Biol., 1937, 125, 1082—1085).—Aq. or acid extracts of the anterior lobe have no medulla-stimulating action. Acid, but not aq., extracts have a cortex-stimulating action on guinea-pigs which is inhibited by simultaneous administration of I.

H. G. R.

Effect of an anterior pituitary extract on serum-calcium and -phosphorus. H. B. FRIEDGOOD and R. MCLEAN (Amer. J. Physiol., 1937, 118, 588—593).—Serum-Ca in guinea-pigs is increased, but serum-PO₄ is unaffected; the action of the extract is therefore parathyrotropic.

R. N. C.

Immediate hyperglycæmic and anti-insulin action of the anterior lobe of the pituitary gland and of the blood in acromegaly. A. W. ELMER, B. GIEDOSZ, and M. SCHEPS (Compt. rend. Soc. Biol., 1937, 125, 1086—1088).—Massive doses of acid extract of the anterior lobe or of the blood-plasma in acromegaly have an immediate diabetogenic action on rabbits.

H. G. R.

Assay of lactogenic extracts of anterior pituitary gland. I. W. ROWLANDS (Quart. J. Pharm., 1937, 10, 216—221).—A method of assay using the pigeon crop-gland test is described. The response given by the gland increases with body-wt.

J. N. A.

Pituitrin anæmia. A. GILMAN and L. GOODMAN (Amer. J. Physiol., 1937, 118, 241—250).—The anæmia in rabbits is the result of H₂O retention, which leads to blood dilution and destruction of erythrocytes.

R. N. C.

Pituitary regulation of water exchange in the dog and monkey. H. L. WHITE and P. HEINBECKER (Amer. J. Physiol., 1937, 118, 276—284).—A diuretic principle is present in the anterior pituitary. It is ineffective in absence of the thyroid, but is not the thyrotropic hormone.

R. N. C.

Carbohydrate storage and maintenance in the hypophysectomised rat. J. A. RUSSELL and L. L. BENNETT (Amer. J. Physiol., 1937, 118, 196—205).—Blood-sugar and liver- and muscle-glycogen maintain their normal levels when the food supply is kept normal, but fall to an extent > in normal animals on fasting even for short periods. The fall is not due to

absence of the posterior pituitary, brain injury, or chronic inanition. A single carbohydrate meal after fasting does not cause increases in body carbohydrates comparable with those produced in normal animals; the initial low fasting level and the low rate of absorption only partly explain this result.

R. N. C.

Site of formation of the posterior lobe hormones. C. FISHER (Endocrinol., 1937, 21, 19—29).—No diuretic, pressor, or oxytocic activity was shown by cat pituitaries in which degeneration of the pars nervosa had been produced experimentally, but in which the pars intermedia was still physiologically active. The elaboration of the diuretic, pressor, and oxytocic principles is in some way related to the pars nervosa.

M. A. B.

Augmentation of ovarian weights as effected by zinc sulphate, antuitrin-S, and thyroid implants. F. E. EMERY (Amer. J. Physiol., 1937, 118, 316—320).

R. N. C.

Effect of the female sex hormone on reptiles. V. DANTCHAKOFF (Compt. rend., 1937, 205, 424—426).—Histological.

Determination of the gonadotropic material of urine of women after castration and the menopause and of normal men. P. A. KATZMAN (Endocrinol. 1937, 21, 89—95).—Adsorption by BzOH gives complete recovery of the gonadotropic material from the urine of pregnancy and from anterior lobe extracts, but not from the urine of women after castration and the menopause, in which BzOH appears to cause a definite reduction in activity. Pptn. with EtOH gives complete recovery in all cases, and tungstic acid (I) is satisfactory if the basic reagent used for decomp. the ppt. is suitably chosen. With the urine of normal men BzOH, (I), and tannic acid all give satisfactory results.

M. A. B.

Menstrual cycle of the primates. X. Oestrone threshold of uterus of *Rhesus* monkey. XI. Part played by oestrogenic hormone in the menstrual cycle. S. ZUCKERMANN (Proc. Roy. Soc., 1937, B, 123, 441—456, 457—471).—X. The effects of the injection of oestrone (I) in spayed *Rhesus* monkeys in producing bleeding suggest that the (I) threshold fluctuates rhythmically.

XI. An artificial menstrual cycle is produced in spayed monkeys by the injection of (I) in increasing amounts for 14 days reduced to a const. low level on and after the 15th day. This cycle is significantly longer than one in which no (I) is injected after the 14th day. The data show that the (I) threshold fluctuates over a wide range. The mechanism of the menstrual cycle is discussed.

E. M. W.

Production of oestrogenic hormone by a transplantable ovarian carcinoma. L. C. STRONG, W. U. GARDNER, and R. T. HILL (Endocrinol., 1937, 21, 268—272).—Transplanted ovarian carcinoma in mice secreted oestrogen in amounts sufficient to produce (a) long-continued oestrous smears which reverted to dioestrous type after removal of tumours and (b) growth of rudimentary mammary glands of males.

J. L. C.

Determination of oestrin in urine with the photo-electric colorimeter. E. H. VENNING, K. A. EVELYN, E. V. HARKNESS, and J. S. L. BROWNE (J. Biol. Chem., 1937, 120, 225—237).—Conditions under which the intensity and stability of the pink colour produced by heating oestrin (I) with conc. H_2SO_4 and PhOH followed by dilution and reheating have been determined, together with a method of extraction of urine to give max. yields of (I), are described. Using special colour filters, (I) can be determined in urines containing $> 2 \times 10^{-50}\%$, and accuracy increases with concn. to a max. of $\pm 5\%$ at $5 \times 10^{-40}\%$. Using pure (I), 10×10^{-6} g. can be determined within $\pm 3\%$. J. N. A.

Modification of the vaginal epithelium in rodents. M. KLEIN (Proc. Roy. Soc., 1937, B, 124, 23—29).—Whereas oestrone (I) alone, progesterone (II) alone, or (II) following (I) injected into ovariectomised golden hamsters did not cause mucification of the epithelial cells of the vagina, (II) together with (I) produced high columnar cells completely filled with mucus, a picture identical with that during pregnancy. P. W. C.

Effect of sex hormones on blood-calcium and inorganic blood-phosphate levels. H. W. MARLOW and F. C. KOCK (Endocrinol., 1937, 21, 72—84).—Non-cryst. purified oestrogenic products (I) prepared from pregnancy urine and pig ovaries had no significant and consistent effect on blood-Ca level when injected into fowls, rats, and rabbits. In gonadectomised rats blood-Ca was slightly $<$ normal and tended to rise after injection of (I). A male hormone concentrate from bull testis tissue was also without effect. M. A. B.

Effect on serum-calcium and inorganic phosphate of fractions obtained from crude ovarian extracts. S. L. HUEY and H. W. MARLOW (Endocrinol., 1937, 21, 85—88).—None of the fractions nor the purified extract produced any definite and consistent change in serum-Ca and inorg. PO_4''' . M. A. B.

Oestrogenic activity in a lignite from Emilia [Italy]. A. MOSSINI (Boll. Soc. ital. Biol. speriment., 1937, 12, 231—232).— Et_2O extracts of the lignite (1 kg.) yield a product of oestrogenic activity [equiv. to 0.08 mg. of folliculin (I)] which does not contain CO and is not identical with (I). F. O. H.

Reversal by progestin of responses of the non-pregnant uterus of the cat. J. H. KENNARD (Amer. J. Physiol., 1937, 118, 190—195). R. N. C.

epi-Etiocholane-3 : 17-diol from male urine.—See A., II, 424.

Substances with a female hormone effect.—See A., II, 423.

α - and β -Estradiol.—See A., II, 417.

Factors influencing vitalisation of the ovarian graft and production of sex hormones in the male rat. C. A. PFEIFFER (Endocrinol., 1937, 21, 260—267).—Grafts from unrelated strains, the presence of lutein tissue, and the respiratory infection "snuffles" are all unfavourable to the vitalisation of ovarian grafts in male rats. In "snuffles" both the

graft and the male hormones are suppressed, toxæmia being the main factor in the latter effect. J. L. C.

Excretion of gonadotropic substance in polycythemia vera. S. L. ISRAEL and T. H. MENDEL (Endocrinol., 1937, 21, 123—124).—Using Zondek's pptn. test no demonstrable quantity of gonadotropic substance could be detected in the urine in polycythemia vera. M. A. B.

Excretion of male hormones. I. C. D. KOCHAKIAN (Endocrinol., 1937, 21, 60—66).—Average excretion of male hormone (I) in young men was 6—8 capon units per litre of urine or 12—16 units per day, and in old men, 2—3 units per day. Very small amounts were excreted by castrated men and dogs. Urinary (I) and synthetic androstenedione injected subcutaneously were recovered only to the extent of 2—6% in the urine, possibly as a result of conversion into less active forms. M. A. B.

Biochemical hydrogenation of androstanedione. A. VERCELLONE and L. MAMOLI (Z. physiol. Chem., 1937, 248, 277—279; cf. A., 1937, II, 199; this vol., 143).—Addition of androstanedione in EtOH to a vigorously fermenting mixture of aq. invert sugar and yeast kept at approx. 22° for 3 days gives isoandrostanediol. W. McC.

Effects of testosterone and testosterone propionate on adult male rats (compared with those on female rats). V. KORENCHESKY, M. DENNISON, and K. HALL (Biochem. J., 1937, 31, 1434—1437).—In male rats, testosterone propionate (I) produced hypertrophy of the secondary sexual organs and hastened the involution of the thymus, whilst testosterone (II) had little or no effect on these organs. In female rats, the effects of (II) on the development of secondary sexual organs and on the thymus were definite, but much $<$ those of (I). After injection of (II), progestational changes were found in the vagina but not in the uterus. Both hormones caused a greater degree of hypertrophy of the female than of the male sexual organs (cf. this vol., 278). W. O. K.

Masculinising action of testosterone propionate and the differentiation of the sex of *Rana temporaria*. L. L. GALLIEN (Compt. rend., 1937, 205, 375—377).—Injection of testosterone propionate into undifferentiated (e.g., metamorphosing totally into female frogs) tadpoles produces a masculinisation of the developing genitalia. F. O. H.

Sterols. XIV—XVII.—See A., II, 416, 424.

Mechanism of convulsions in insulin hypoglycæmia: interrelationship of blood concentration, cerebrospinal pressure, and convulsions. D. L. DRABKIN and I. S. RAYDIN (Amer. J. Physiol., 1937, 118, 174—183).—Previous administration of H_2O to dogs affects the incidence of convulsions after insulin, "dehydrated" animals being free from convulsions. Anhydramia is a stage between hypoglycæmia and the onset of convulsions. R. N. C.

Antiglycogenolytic action of insulin. L. KÉPINOV (Compt. rend., 1937, 205, 88—90; cf. this vol., 228, 320).—Adrenaline does not mobilise glucose from a frog liver perfused for 20 min. with Locke—

Tyrosine solution containing insulin and in this respect resembles the behaviour of the liver of a hypophysectomised frog or a liver which has suffered prolonged perfusion. J. L. D.

Vitamin-free diets and the action of insulin. R. W. MARTIN (*Z. physiol. Chem.*, 1937, 248, 242—255).—Pancreatectomised dogs on a diet almost free from vitamin- B_1 and - B_2 develop severe and ultimately fatal hyperglycemia and glycosuria despite regular administration of adequate doses of insulin (I). The symptoms are only temporarily relieved by very greatly increased doses of (I) but the disease is rapidly cured by administration of - B_1 and - B_2 (but not by that of - B_1 alone). Hence (I) appears to act effectively only in presence of - B_2 or of - B_1 + - B_2 . W. McC.

Insulin tannate. F. LUN (*Compt. rend. Soc. Biol.*, 1937, 125, 1088—1090).—The activity of insulin (I) is not affected by addition of tannic acid (II) but the return of the blood-sugar to normal vals. is retarded. Addition of small quantities of $\text{Na}_2\text{S}_2\text{O}_3$ to (I)-(II) preps. prolongs the hypoglycosuria. Addition of arginine does not affect the action of (I). H. G. R.

Blood-glutathione during various experimental conditions. III. Thyroparathyroidectomy and treatment with parathyroid hormone. P. CACCIALANZA (*Boll. Soc. ital. Biol. sperim.*, 1937, 12, 119—120).—The operation in dogs reduces blood-glutathione (I), the normal vals. of reduced and total (I) decreasing from 0.039, 0.043 to 0.029, 0.031%, respectively. The decrease is prevented by injection of parathyroid hormone. F. O. H.

Increased calcium appetite of parathyroidectomised rats. C. P. RICHTER and J. F. ECKERT (*Endocrinol.*, 1937, 21, 50—54).—The average daily intake of 2.4% aq. Ca lactate increased 4-fold after parathyroidectomy, but was only about half that calc. by MacCallum as necessary for normal growth. The intake returned to normal after parathyroid implantation. M. A. B.

Action of parathormone. III. H. K. GOADBY (*Biochem. J.*, 1937, 31, 1530—1533; cf. A., 1936, 526).—The direct action of parathyroid hormone on the kidneys to produce increased excretion of PO_4''' is confirmed by the hormone producing a much smaller PO_4''' diuresis in persons suffering from nephritis than when they have recovered. F. O. H.

Effect of calcium and parathormone on serum-calcium in normal, Eck-fistula, and gastrectomised dogs. L. G. LEDERER and L. A. CRANDALL, jun. (*Amer. J. Physiol.*, 1937, 118, 52—56).—Eck fistula lowers the fasting Ca level and lessens the rise of Ca after oral administration of Ca lactate (I) or gluconate (II), and the Ca-mobilising action of parathormone; CaCl_2 injected intravenously is removed with abnormal rapidity. Gastrectomy results in a greater rise of Ca after oral administration of (I), but not after (II). R. N. C.

Test for abnormally large amounts of parathyroid hormone in blood. B. HAMILTON and W. J. HIGHMAN (*J. Clin. Invest.*, 1936, 15, 99—100).—The serum is injected intramuscularly into the legs

of a rabbit which is then given 4 successive doses of CaCl_2 (0, 1, 3, 5 hr.) by stomach tube. Results are interpreted on the basis of the increase in serum-Ca in the rabbit. CH. ABS. (*p*)

Phloridzin diabetes and the endocrine system. I. Thyroidectomy. II. Thyroidectomy and administration of cortical hormone. C. LOMBROSO (*Boll. Soc. ital. Biol. sperim.*, 1937, 12, 133—134, 134—135).—I. The glycosuria due to phloridzin almost disappears after thyroidectomy.

II. The diminished glycosuria due to thyroidectomy returns to normal (diabetic) levels, or even higher, on administration of adrenal cortex hormone. F. O. H.

Phospholipins of the brain, kidneys, and heart of white rats in hyperthyroidism. A. WEIL (*Endocrinol.*, 1937, 21, 101—108).—Feeding thyroid powder to male rats decreases body-wt. and increases wt. of heart and kidneys with corresponding increase in phospholipins (I). Aq. COMe_2 extracts of kidneys and heart increase and of brain decrease. Total P and P of the different extracts increase proportionally to the increase in (I) and in wt. of the three organs. (I) are not changed qualitatively since there is no change in % P or the ratio total/lipin P. M. A. B.

Thyroxine, di-iodotyrosine, and liver-glycogen. F. VACIRCA (*Boll. Soc. ital. Biol. sperim.*, 1937, 12, 107—108).—Injection of di-iodotyrosine into dogs does not affect liver-glycogen but inhibits the glycogenolysis due to thyroxine. F. O. H.

Isoelectric point of thyroglobulin. I. A. SMORODINCEV and A. M. FELDT (*Compt. rend. Acad. Sci. U.R.S.S.*, 1937, 15, 491—494).—Purified thyroglobulin has an isoelectric point, determined by four different methods, of p_H 4.5. It begins to separate from solution on addition of $(\text{NH}_4)_2\text{SO}_4$ at a concn. of 37% of salt and is completely pptd. at 52%. W. O. K.

Dissociation constant of thyroglobulin. I. A. SMORODINCEV and A. M. FELDT (*Compt. rend. Acad. Sci. U.R.S.S.*, 1937, 16, 51—53).—1% solutions of thyroglobulin (prepared by the method of Heidelberger and Palmer; A., 1933, 967), containing varying quantities of HCl, were titrated electrometrically. The absorption capacity for H^+ was found to be 1.05×10^{-3} g. per g., and the equiv. 950. The dissociation const. was 1.78×10^{-3} . R. C. M.

Extracts of the pineal gland and secretion of adrenaline. J. MALMÉJAC and E. DESANTI (*Compt. rend. Soc. Biol.*, 1937, 125, 1077—1078).—Injection of pineal extract causes an increased secretion of adrenaline. H. G. R.

Effect of administration of vitamins on production of defence proteinases. E. ABDERHALDEN (*Fermentforsch.*, 1937, 15, 264—273; cf. this vol., 37).—In rabbits, parenteral administration of vitamin-A, - B_1 , and (in relatively large doses) -C results in appearance of defence proteinases in the urine which act, in varying degrees, on the organs in which hormones are produced. W. McC.

Relation of certain dietary essentials to fertility in sheep. G. H. HART and R. F. MILLER (*J. Agric. Res.*, 1937, 55, 47—58).—Restriction of sup-

plies of vitamin-A during the breeding season did not affect the no. of lambs produced by adult ewes, previously in good condition, but ewe lambs similarly treated produced lambs which were either born dead or died soon after birth. Low-protein-low-P diet probably affects fertility more seriously than when protein alone is restricted. A. G. P.

Sources of vitamin-A for chicks. I. Comparison of carotene and vitamin-A as found in cod-liver oil. R. M. BETHKE and P. R. RECORD (53rd Ann. Rept. Ohio Agric. Exp. Sta. Bull., 1935, No. 548, 73).—The basal requirement of vitamin-A for chicks during the first 8 weeks was met by 10^{-4} g. of carotene (I) per 100 g. of ration. -A supplied as cod-liver oil was as effective as (I) on the same biological rat-unit basis. CH. ABS. (p)

Relation of vitamin-A to anophthalmos in pigs. F. HALE (Amer. J. Ophthalmol., 1935, 18, 1087—1093).—Maternal deficiency in vitamin-A resulted in defects (cleft palate or lip, accessory ears, etc.) of the offspring of pigs. CH. ABS. (p)

Vitamin-A deficiency in the dog. P. D. CRIMM and D. M. SHORT (Amer. J. Physiol., 1937, 118, 477—482). R. N. C.

Evaluation of vitamin-A supplements by spectrometric methods. W. D. MCFARLANE and L. RUDOLPH (Sci. Agric., 1936, 16, 398—403).—The spectrographic method probably gives satisfactory results for the better grade of oils. Vals. for low-grade oils may be unduly high. Those for pilchard oils do not agree with results of biological assays. A. G. P.

Differences in the chromogenic properties of fresh-water and marine fish-liver oils. A. E. GILLAM, I. M. HEILBRON, E. LEDERER, and V. ROSANOVA (Nature, 1937, 140, 233).—Spectrographic data for liver oils and concentrates from several species of fresh- H_2O fish are recorded. These show an absorption band in $SbCl_3$ solution at 690—697 m μ . (or 645 m μ .), of intensity $>$ that of the 620 band. In addition, the ultra-violet absorption max. is displaced from the 328 m μ . of marine liver oils to 345—350 m μ ., with the frequent appearance of another band at 280—285 m μ . The 340—350 m μ . max. appears to be associated with the 693 m μ . $SbCl_3$ chromogen. In the liver oils of fresh- H_2O fish the 693 : 620 intensity ratio is approx. 2 : 1, whereas for marine fish it is generally $<$ 0.2 : 1. The 693 m μ . chromogen may be a second vitamin-A to some extent sp. for fresh- H_2O fish. Accurate determination of the -A content of the liver oils of these fish, by physico-chemical methods, is not yet possible. L. S. T.

Possible vitamin-A₂. J. R. EDISBURY, R. A. MORTON, and G. W. SIMPKINS (Nature, 1937, 140, 234).—In the $SbCl_3$ test for vitamin-A, an additional band occurs near 693 m μ . In halibut-liver oils the relative intensities 620 m μ . : 693 m μ . are approx. 6 : 1, and in halibut visceral oils 10 : 1. The 693 m μ . chromogen is rarely detectable in cod-liver oils and never in whale-liver oils. Although frequently absent from the -A fraction of eyes, it has been observed in extracts from goldfish eyes. In brown trout the

693 m μ . chromogen occurs in the non-saponifiable extracts from livers and viscera, but the 620 m μ . band has not been detected. Direct absorption spectra showed the presence of three broad bands with max. at 470, 350, and 287 m μ ., the ultra-violet bands varying in intensity with the 693 m μ . band in the colour test. In chemical separations with liver oils, the 693 m μ . chromogen follows -A, the ratio 620 m μ . : 693 m μ . remaining approx. const. for a given species. This chromogen with its characteristic ultra-violet absorption is designated "vitamin-A₂."

L. S. T.

Quantitative relationships in vitamin-B complex studies. R. C. BENDER and G. C. SUPPLEE (J. Amer. Chem. Soc., 1937, 59, 1178—1182).—Each of the three factors -B₁, -B₂, and -B₆ affects the growth rate of rats to a characteristic extent, which, within limits, \propto the amount present, but is influenced by the other two factors. A simplified basal ration having sucrose as carbohydrate, and supplemented with two of the factors -B₁, -B₂, and -B₆ may be used for the biological assay of the third factor. -B₆ may be assayed comparatively, in the presence of known amounts of -B₁ and -B₂, by the % incidence of dermatitis. A. Li.

Utilisation and retention of vitamin-B by young children. E. M. KNOTT (J. Nutrition, 1936, 12, 597—611).—Retention of vitamin-B increased with the level of ingestion in the range examined. The optimum requirement for young children is approx. 20 units per kg. body-wt. A. G. P.

Vitamin-B assay using rat curative method with modified diets and oral administration of addenda. F. P. DANN (J. Nutrition, 1936, 12, 461—468).—Smith's method (U.S. Publ. Health Rep., 1930, 45, 116) gives satisfactory results provided certain details of technique are adhered to. A. G. P.

Chemistry of vitamin-B₁. T. IMAI (J. Biochem. Japan, 1937, 25, 95—107).—A discussion of the constitution of vitamin-B₁ and thiochrome (cf. A., 1936, 1159, 1394; 1937, II, 377). F. O. H.

Crystalline vitamin-B₁. (A) Clinical observations. (B) Observations in diabetes. M. G. VORHAUS, R. R. WILLIAMS, and R. E. WATERMAN (J. Amer. Med. Assoc., 1935, 105, 1580—1583; Amer. J. Digest. Dis. Nutrition, 1935, 2, 541—557).—(A) Curative effects of cryst. -B₁ in a no. of diseases are recorded.

(B) Deficiency of -B₁ disturbs the carbohydrate metabolism, causing an increase in blood-sugar and in the glycogen content of liver and muscle. Possible relationships between -B₁ deficiency and diabetes mellitus are discussed. CH. ABS. (p)

Destruction of vitamin-B₁ in blood. P. C. LEONG (Biochem. J., 1937, 31, 1391—1395).—No appreciable destruction of vitamin-B₁ occurs when the aq. hydrochloride at p_H 6.0 is kept at 0° for 3 months, or at 37° for 24 hr. In oxalated blood, fresh or boiled, it is stable at 19° for 24 hr. but appreciably destroyed at 37°. W. O. K.

Pyrimidine and thiazole intermediates as substitutes for vitamin-B₁. W. J. ROBBINS, M. A.

BARTLEY, A. G. HOGAN, and L. R. RICHARDSON (Proc. Nat. Acad. Sci., 1937, 23, 388—389).—Polyneuritis in pigeons may be cured by doses of 5 mg. each of 6-amino-2-methyl-5-bromomethylpyrimidine and 4-methyl-5- β -hydroxyethylthiazole given simultaneously. Administration of the compounds separately at a 24-hr. interval has no curative action. Vitamin- B_1 is probably synthesised from the two intermediates in the crop or tissues of the pigeon (cf. this vol., 409). A. G. P.

Crystalline vitamin- B_1 from natural sources. R. D. GREENE and A. BLACK (J. Amer. Chem. Soc., 1937, 59, 1395—1399).—Extract of rice polishings or yeast is shaken with Norit, and then with fuller's earth. The latter is extracted with $\text{EtOH}-\text{C}_5\text{H}_5\text{N}\cdot\text{HCl}$, and the extract evaporated, taken up in PrOH (with NaHCO_3), and freed from solvents. The aq. solution, saturated with NaCl , is then extracted with PhOH , from which the vitamin is removed by very dil. HCl . The sequence is repeated up to PhOH , and the $-B_1$ crystallised from $\text{PhOH}-\text{BuOH}$ and then from EtOH . A. LI.

Use of a ten-day period for the assay of vitamin- B_1 by the rat-growth technique. F. W. SCHULTZ and E. M. KNOTT (J. Nutrition, 1936, 12, 583—596).—The technique of the method is described. A. G. P.

Determination of vitamin- B_1 in blood by a modification of Schopfer's test. A. P. MEIKLEJOHN (Biochem. J., 1937, 31, 1441—1451).—The method of Schopfer (A., 1936, 905) for determination of small amounts of vitamin- B_1 by means of its growth-promoting activity on *Phycomyces Blakesleeanus* can be used with certain modifications for determination of $-B_1$ in small amounts (2 c.c.) of blood. The validity of the test is discussed. P. W. C.

Response of rats, chicks, and turkey poults to crystalline vitamin- B_2 (flavin). S. LEPKOVSKY and T. H. JUKES (J. Nutrition, 1936, 12, 515—526).—Effects of feeding a diet containing the other factors of the vitamin- B complex except $-B_2$ are recorded. Deficiency of $-B_2$ in chicks and turkeys lowers the efficiency of food utilisation more conspicuously than it does the appetite. A. G. P.

Differentiation between vitamin- B_2 and an insoluble factor preventing a pellagra-like syndrome in chicks. I, II. A. T. RINGROSE and L. C. NORRIS (J. Nutrition, 1936, 12, 535—552, 553—569).—I. Dried pig liver contains a factor required to prevent the development of a pellagra-like syndrome in chicks receiving an egg-white diet, and also a factor required for the growth of chicks receiving a purified casein diet. The pellagra-preventing factor differs from the growth factor which is vitamin- B_2 . Autoclaving the egg-white at p_H 6.0 or 9.0 (6 hr., 15 lb.) destroyed its ability to cause the pellagra-like syndrome, probably by releasing the preventive factor.

II. Vitamin- B_2 contains two factors, one preventing pellagra and one promoting growth. The former occurs in cereals and coagulated egg-white but not in casein. A. G. P.

Influence of the feed of the cow on the vitamin- B_2 content of milk. C. H. HUNT and A. E. PERKINS (53rd Ann. Rept. Ohio Agric. Exp. Sta. Bull., 1935, No. 548, 74).—Cows receiving a low-protein, low $-B_2$ ration of timothy hay-beet pulp yielded milk of lower $-B_2$ potency than those receiving a winter ration of lucerne hay. The $-B_2$ content of milk from cows at pasture \propto that of the herbage.

CH. ABS. (p)

Vitamin- B_2 complex. Differentiation of the antiblacktongue and "P.-P." factors from lactoflavin and vitamin- B_6 . VII. Experiments with monkeys and other species. L. J. HARRIS (Biochem. J., 1937, 31, 1414—1421; cf. A., 1936, 254).—Monkeys on a diet containing $-B_1$, $-B_6$, and lactoflavin resemble human beings or dogs and differ from rats in that they require the human antipellagra, or canine antiblacktongue, factor. When this is absent, they develop marked loss of appetite, diarrhoea, and vomiting followed rapidly by death without prominent skin lesions. W. O. K.

Distribution of vitamin- B_4 in some plant and animal products. O. L. KLINE, H. R. BRD, C. A. ELVEHJEM, and E. B. HART (J. Nutrition, 1936, 12, 455—460).—Dried grass, peanuts, wheat germ, pork brain, and kidney were good sources of vitamin- B_4 for chicks. Cereals were relatively poorer; white maize and hulled oats were superior to yellow maize and wheat. A. G. P.

Experimental scurvy. XXXV. Bezssonoff's reacting substance and its identity with vitamin-C. H. TSUGE (J. Biochem. Japan, 1937, 25, 219—236).—The substance reacting with Bezssonoff's reagent (A., 1926, 722) and vitamin-C show identical behaviour with respect to solubility, permeability, adsorption, pptn. by basic Pb acetate, oxidation, and stability to heat, alkalis, or acids. The reactions of the reagent with phenolic substances [*o*- and *p*- $\text{C}_6\text{H}_4(\text{OH})_2$ and $-\text{OH}\cdot\text{C}_6\text{H}_4\cdot\text{OMe}$, but not $-\text{C}_6\text{H}_4(\text{OMe})_2$ give positive tests] are discussed. F. O. H.

Histochemical localisation of vitamin-C in lymphoid organs (tonsils, appendix). D. ZIMMET and H. DUBOIS-FERRIERE (Compt. rend. Soc. Biol., 1937, 125, 996—998; cf. this vol., 154).—These organs contain considerable quantities of vitamin-C localised in the reticulo-endothelial system. In acute appendicitis, -C of the appendix is reduced by about 30%. H. G. R.

Vitamin-C deficiency, rheumatic fever, and rheumatoid arthritis. II. Rheumatoid (atrophic) arthritis. J. F. RINEHART (Ann. Intern. Med., 1936, 9, 671—689).—Chronic vitamin-C deficiency in pigs produces an arthropathy resembling rheumatoid arthritis. CH. ABS. (p)

Absorption of vitamin-C by the skin. M. KASAHARA and K. KAWASHIMA (Klin. Woch., 1937, 16, 135—136).—The vitamin-C content of human milk is increased by applying ointment containing -C to the skin of the mammary gland. W. McC.

Distribution of ascorbic acid in the organism. A. GIROUD, A. R. RATSMAMANGA, C. P. LEBLOND, M. RABINOWICZ, and H. DRIEUX (Bull. Soc. Chim. biol., 1937, 19, 1105—1125).—Tables show the

ascorbic acid contents of 59 tissues of ox and horse. The acid is present in practically all tissues and abundant in several endocrine glands, in the activity of which it probably plays a rôle. P. W. C.

Seasonal variation in the vitamin-C content of human milk. M. KASAHARA and K. KAWASHIMA (*Z. Kinderheilk.*, 1936, 58, 191—192).—The vitamin-C content of the milk exhibits individual and seasonal variations, being lowest during Jan.—Feb. and highest in May. The average val. for the milk of Japanese women is 0.0045% and is independent of the age of mother or infant. W. McC.

Vitamin-C content of colostrum. M. KASAHARA and K. KAWASHIMA (*Klin. Woch.*, 1936, 15, 1278—1279).—The vitamin-C content of human milk increases on the 3rd day after parturition, remains 2—4 times as great as that of the normal milk for approx. 3 weeks, and then gradually returns to normal vals. In goats the -C content of the milk varies in a similar way, the increase being accompanied by a corresponding decrease in -C content of the aq. humour, probably due to mobilisation of the -C depots of the body. W. McC.

Vitamin-C content of [cerebrospinal] fluid. I. Fluid of animals. M. KASAHARA and H. GAMMO. II. Fluid of monkeys suffering from hypovitaminosis-C. M. KASAHARA, M. TATSUMI, and H. GAMMO (*Z. ges. Neurol. Psychiat.*, 1936, 157, 147—148, 149—152).—I. The average vitamin-C contents of the fluid of the rabbit, dog, goat, cat, and monkey are 0.038, 0.066, 0.042, 0.046, 0.023 mg. per c.c., respectively. In all the species there are wide individual variations.

II. The -C content of the fluid of monkeys on a -C-free diet decreases to zero after 3—6 weeks although no scorbutic symptoms are observed. Subsequent subcutaneous injection of large amounts of -C increases the content to \times twice normal.

W. McC.

Retinal substances. V. Isolation of vitamin-C from the retina. O. BRUNNER and W. KLEINAU (*Monatsh.*, 1937, 70, 374—376).—Ascorbic acid was isolated from the retinas of cattle by the method of Hinsberg and Ammon as the 2:4-dinitrophenyl-oxazone of dehydroascorbic acid. The yield (20 mg. from 225 retinas) is 28% of the amount found by titration. A. G.

Specificity of indophenol in the determination of ascorbic acid in fermented products. F. W. FOX and W. STONE (*Nature*, 1937, 140, 234).—A reducing substance other than ascorbic acid (I) and having no antiscorbutic activity is formed in large amounts in Kaffir beer, particularly during boiling of the mash and fermentation. At $p_H > 2.0$, but not at 1.2—1.8, it behaves as (I) with indophenol (II). (I) oxidase and the Folin uric acid reagent are not sp. for (I). The correct (I) content of this beer corresponds with approx. 0.8 mg. per 100 ml. obtained with the Norit C procedure, and by titration with (II) at p_H 1.2—1.8. L. S. T.

Enzymic determination of ascorbic acid. M. SRINIVASAN (*Biochem. J.*, 1937, 31, 1524—1529).—The application of ascorbic acid (I) oxidase (cf. this

vol., 29) is described. The reaction is not inhibited by neutralised $\text{CCl}_3\text{CO}_2\text{H}$. Some sources of (I) contain impurities [not pptd. by $\text{Hg}(\text{OAc})_2$] which reduce the indophenol reagent but are not enzymically oxidised. F. O. H.

Determination of vitamin-C saturation. I. S. WRIGHT, A. LILIENTFELD, and E. MACLENNATHEN (*Arch. Int. Med.*, 1937, 60, 264—271).—Following intravenous injection of ascorbic acid approx. 50% is normally excreted in the urine in 24 hr., and 40% in the first 5 hr. H. G. R.

Vitamin-D studies in cattle. III. Influence of solar ultra-violet radiation on the blood chemistry and mineral metabolism of calves. C. W. DUNCAN and C. F. HUFFMAN (*J. Dairy Sci.*, 1936, 19, 291—303).—In the development of rickets in calves when -D or ultra-violet radiation is lacking, the decreases of the [Ca] and [P] in the plasma were the first evidences of rickets. Deficiency of radiant energy reduced the ash content of the dry, fat-free rib. Exposure to spring sunshine caused an increase in Ca and inorg. P which persisted in the summer months. W. L. D.

Prevention of rickets with a cod-liver oil concentrate in milk. M. G. PETERMAN and E. EPSTEIN (*Amer. J. Dis. Children*, 1935, 50, 1152—1158).—Daily administration of 228 units of vitamin-D as cod-liver oil concentrate in evaporated milk protected infants against rickets in the susceptible period. CH. ABS. (p)

Vitamin-D content of New Zealand fish-liver oils. M. M. CUNNINGHAM (*New Zealand J. Sci. Tech.*, 1937, 18, 898—899; cf. A., 1936, 391).—Vitamin-D contents, in international units per g., were as follows: kahawai (*Arripis trutta*), 350; tarakihi (*Dactylopagrus macropterus*), 17; black flounder (*Rhombosolea retiaria*), 1400; snapper (*Pagrosomus auratus*), 57; red cod (*Physiculus bachus*), 3; shark (*Elasmobranchii*), 13. Great variation in -D content may occur within one order. L. D. G.

Assay of vitamin-D with chickens. O. N. MASSENGALE and C. E. BILLS (*J. Nutrition*, 1936, 12, 429—446).—The method described is based on the determination of femur ash. A table is given relating the % ash with -D units in terms of cod-liver oil or of irradiated ergosterol (I) together with the probable error. With the diet used, in which Ca:P = 2:1, good calcification resulted from addition of 18 international units of -D as cod-liver oil. The latter and (I) are not generally comparable as sources of -D, their relative efficiency varying with the degree of calcification. A. G. P.

Relation of vitamin-E to the anterior lobe of the pituitary gland. M. M. O. BARRIE (*Lancet*, 1937, 233, 251—254).—Pathological changes produced in female rats and their young by deprivation of vitamin-E are described. It is concluded that -E is necessary for the normal function of the anterior lobe of the pituitary. L. S. T.

Vitamin-P. II. S. S. ZILVA (*Biochem. J.*, 1937, 31, 1488; cf. this vol., 328).—Details are given of the pre-experimental condition of the animals used

(*loc. cit.*). The negative results then obtained cannot be ascribed to unsatisfactory state of the animals employed. P. W. C.

Distribution and properties of the anti-gizzard-erosion factor required by chicks. H. R. BIRD, O. L. KLINE, C. A. ELVEHJEM, and E. B. HART (J. Nutrition, 1936, 12, 571—582).—The factor is distinct from the anti-hæmorrhagic factor required by chicks. It occurs in pig lung, liver, and kidney, oats, wheat, and maize. Its heat-stability varies somewhat with the source. It is insol. in Et_2O and EtOH and accompanies the alkali-sol., acid-precipitable proteins in the fractionation of lung tissue. A. G. P.

Constitution of plant-cell membranes. W. STILES (Trans. Faraday Soc., 1937, 33, 923—927).—The wall of a plant cell serves to give rigidity to the plant and is generally completely permeable to H_2O and dissolved substances. The protoplasm as a whole may act as a membrane determining the passage of substances into the central vacuole from an external medium, but it is probable that the limiting layers of the protoplast, forming a thin membrane composed largely of fatty substances but with pores containing an aq. phase, determine the entrance of substances into plant cells. J. W. S.

Permeability of plant protoplasts to non-electrolytes. R. COLLANDER (Trans. Faraday Soc., 1937, 33, 985—990; cf. A., 1933, 545).—The permeability of *Chara* and other plant cells to non-electrolytes can be explained on the basis of the "lipin-sieve" theory. It is suggested that the plasma membrane consists of a few layers of regularly oriented lipin mols. J. W. S.

Electrical evidence on the nature and alterations of membranes in large plant cells. L. R. BLINKS (Trans. Faraday Soc., 1937, 33, 991—997).—The author's recent work on the electrical resistance and impedance of very large plant cells is summarised. J. W. S.

Protoplasmic surface in certain plant cells. W. J. V. OSTERHOUT (Trans. Faraday Soc., 1937, 33, 997—1002).—The surface of the protoplasm of the large multinucleate cells of *Valonia*, *Halicystis*, and *Nitella* behaves as an oily liquid and appears to display a true surface tension. It has a low dielectric const. and resembles guaiacol (I) in its low permeability to ions, the order of penetration of which is $\text{K}^+ > \text{Na}^+ > \text{Ca}^{++}$, Mg^{++} , and $\text{Cl}^- > \text{SO}_4^{--}$. NH_3 and guanidine enter the *Valonia* protoplasm by compound formation, whilst H_2S enters by diffusion, so the surface appears to be acid. Certain substances can be removed from the surface (*e.g.*, by H_2O) without causing disintegration, and the properties are restored when these are returned. The surface layer is probably multimol. Diffusion tests in (I) layers are described which may be parallel to the phenomena in living cells. J. W. S.

Selective accumulation with reference to ion exchange by the protoplasm. S. C. BROOKS (Trans. Faraday Soc., 1937, 33, 1002—1006).—The ion exchange theory in which H^+ is replaced by K^+ and HCO_3^- (or other anion) by Cl^- should be modified to include intermediate steps in which K^+ and Cl^-

form compounds with some constituent of the protoplasm. Rb^+ , radioactive K^+ , and methylene-blue all show evidence of combining with the protoplasm before entering the sap of *Valonia* and *Nitella*. J. W. S.

Measurement of the oxidising-reducing power of living vegetable tissue. B. A. RUBIN, N. M. SISAKIAN, and O. T. LUTIKOVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 495—498).—The reducing power is determined by introducing into the leaf, by the technique of vac. infiltration, aq. ascorbic acid (I) (oxidised by a current of O_2 in presence of apple juice) and measuring the reduction after 24 hr. The oxidising power is similarly determined by introducing unoxidised (I) by infiltration or by measuring the rate of oxidation of (I) in presence of macerated leaf tissue. W. O. K.

Availability of plant nutrients. P. L. HIBBARD (Proc. Soil Sci. Soc. Amer., 1936, 1, 149—151).—The rate at which substances become available is affected by physical, chemical, and biological conditions in the soil, the nature of the plant, and climate. A. M.

Salt accumulation by plants. Rôle of growth and metabolism. F. C. STEWARD (Trans. Faraday Soc., 1937, 33, 1006—1016).—Salt accumulation in plants cannot be considered as a passive property of membranes, since the latter also represent boundary surfaces at which reactions and energy exchanges may occur, and their permeability alone does not suffice for salt accumulation. Salt absorption is classified as "primary" when it involves absorption without loss of ions other than H^+ and HCO_3^- , or as "induced" when it is produced by a change in composition of the external medium. The relationship between growth and salt accumulation cannot yet be attributed to any definite metabolic action. The effects of light, O_2 , temp., and concn. and p_{H} of the medium on salt uptake and the parallelism of the latter with respiration and metabolic activity are discussed. J. W. S.

Cytological studies of toxicity in meristem cells of roots of *Zea mais*. I. Effects of neutral salts. J. K. EDWARDS (Amer. J. Bot., 1936, 23, 483—489).—Effects of MgCl_2 , CaCl_2 , KCl , and NaCl in various concns. are examined. A. G. P.

Intake of copper and manganese by wheat from media of different p_{H} . K. BORATYNSKI and H. BURSTRÖM (Rocz. Nauk. Roln. Leś., 1937, 38, 147—170).—With media containing 0.00025—0.0001M-Cu, the Cu intake of wheat increased with rising p_{H} in the range 3.5—7.0. The intake of Mn was similarly affected by p_{H} but to a smaller extent. The N source (NH_4^+ , NO_3^-) did not affect the intake. In the presence of 0.00025M-Cu, K was not absorbed by, but was irregularly eliminated by, the plants. In presence of similar concns. of Mn, K was steadily absorbed in amounts which increased with rising p_{H} > 3.8. Cu is stored principally in the meristematic cells at the growing points of the plants. A. G. P.

Drought-resistance of the soya bean. H. F. CLEMENTS (Res. Stud. State Coll. Washington, 1937, 5, 1—16).—Soya beans grown with a restricted H_2O supply showed lower growth rates (without change

in external appearance), higher hemicellulose (I) and starch contents (normal sugar), and higher N metabolism than did controls grown under optimum conditions. Drought probably diminishes the translocation of carbohydrates within the plants, but does not affect photosynthesis. The turgid condition of cells of drought-resistant plants may be maintained by the action of (I) in increasing the η of the protoplasm. A. G. P.

Movement of fluorescein in the plant. A. RHODES (Proc. Leeds Phil. Soc., 1937, 3, 389—395).—In the conducting tissues of plants fluorescein (I) shows fluorescence only at $p_H > 5.0$. Treatment of sections with NH_3 vapour reveals penetration of (I) into the xylem to distances even $>$ those into phloem. A. G. P.

Biochemically altered sporopollenins. XII. Membranes of spores and pollen. F. ZETZSCHE and J. LIECHTI (Brennstoff-Chem., 1937, 18, 280—281; cf. A., 1932, 665, 784).—Examination by the methods previously described of *Lycopodium* spores and the pollen of *Corylus avellana* which had been allowed to putrefy for some months showed that the accompanying biochemical processes had produced marked changes in the sporopollenins. A. B. M.

Structure of the non-starch-containing beet chloroplast. E. WEIER (Amer. J. Bot., 1936, 23, 645—652).—The chloroplast consists of a colourless matrix in which are embedded grana associated with chlorophyll (I) and Sudan-staining substances. Willstätter's conception of the colloidal condition may be explained by the association of the (I)-lipin complex with the grana. A. G. P.

Behaviour of nitrogenous substances during yarovisation of plants. I. N. KONOVALOV and I. E. ROGALEV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 16, 65—68).—Yarovisation is accompanied by a slight increase in total N content (probably resulting from relative decrease in carbohydrate reserve), a considerable decrease in insol. protein, and a corresponding increase in sol. protein. Non-protein-N, which increases during soaking prior to yarovisation, decreases during yarovisation with the formation of sol. protein, thus indicating a re-synthesis of protein during the process. In untreated seeds germinating at high temp. protein decomp. reaches a more advanced stage than in yarovisation. A. G. P.

Metabolism of nitrogen; the appearance of allantoinase and urease in the germination of corncockle (*Agrostemma Githago*, L.). A. BRUNEL and R. ECHEVIN (Compt. rend., 1937, 205, 81—83; cf. this vol., 284).—During germination, NH_3 , amide-N, purine-N, and allantoinic acid (which is absent from the seeds) increase, whereas allantoin-N decreases. Allantoinase and urease are present in 21-days-old seedlings, but allantoinase and uricase are not. J. L. D.

Reduction of nitrous acid to hydroxylamine by higher plants. Role of ascorbic acid. M. LEMOIGNE, P. MONGUILLON, and R. DESVEAUX (Compt. rend., 1937, 204, 1841—1843; cf. A., 1936, 639).—The press juice of lilac leaves even when boiled

or treated with $Pb(OAc)_2$ rapidly destroys $NaNO_2$ or $p-SO_3H \cdot C_6H_4 \cdot N_2Cl$ at p_H 4.5, and at room temp. 60% disappears immediately. NH_2OH is formed in varying amounts in these reactions. Ascorbic acid (I) with $NaNO_2$ in concns. of 0.01N affords NO_2 (cf. A., 1934, 870) but with 0.00625N-(I) and $<0.001N$ - $NaNO_2$ NH_2OH is formed. J. L. D.

Amino-nitrogen and reducing sugars of green and chlorophyll-deficient types of maize. M. G. GRONER (Amer. J. Bot., 1936, 23, 453—461).—The NH_2-N content of albino seedlings was \gg that of green plants of the same age and stock. Under conditions of carbohydrate starvation, NH_2-N accumulated both in light and in darkness (probably as a result of decomp. of protein in respiratory processes) and did not increase when sugars were supplied artificially. Feeding glucose or maltose (I) to seedlings deprived of normal carbohydrate supplies by removal of the endosperm inhibited the accumulation of NH_2-N , (I) being the more effective. The reducing sugar (II) content of seedlings remained substantially const. in all experiments. Certain NH_2 -acids may give rise to (II). The diminution of NH_2-N during the development of chlorophyll in leaves is ascribed to the protein-sparing action of the photosynthesised carbohydrates. A. G. P.

Ureides and free urea, degradation products of the purines of *Soja hispida*, Mnch. R. ECHEVIN and A. BRUNEL (Compt. rend., 1937, 205, 294—296).—Free urea does not exist in the seeds or seedlings of *Soja*. The purine-N of 16-day seedlings germinated in the dark is $>$ in the light. The seeds contain no purine-N and have no action on allantoinic acid (I), but young seedlings contain allantoinase (16-day seedlings contain a trace) which converts (I) into urea and $CHO \cdot CO_2H$. The allantoin- and allantoinic acid-N content increase as the age of the seedlings increases but there is no free urea because of the presence of urease. Uricase and allantoinase are present in the seeds and seedlings. J. L. D.

Exudation of glutamine from Chewing's fescue. B. W. DOAK (New Zealand J. Sci. Tech., 1937, 18, 844).—The white exudate from tops of *Festuca rubra*, var. *fallax*, following application of $(NH_4)_2SO_4$ contains glutamine. Brown-top (*Agrostis tenuis*) growing in association with the fescue produces no exudate. A. G. P.

Formation of alkaloids in the plant. J. GUTSCHMIDT and E. GLET (Apoth.-Ztg., 1937, 52, 33—34).—Alkaloids are considered to be abnormal products of the N metabolism, mainly the protein metabolism, of plants, and to be formed during the period of max. growth; their production parallels that of uric acid during gout, cystine in urine, etc. This explains why alkaloid syntheses in the plant are not quant., why so many alkaloids are formed in one plant, and why alkaloid-free *Conium*, *Papaver*, etc. can be grown by changing the cultural conditions. R. S. C.

Early and late ripening [of fruit]. R. NUCCORINI [with ZACCAGNINI, F. CERRI, G. DUCCI, U. MARTELLI, and E. BAGNOLI] (Ann. Sperim. agrar., 1935, 17, 41—71; Chem. Zentr., 1936, i, 3763).—

In fruit ripened at relatively low temp. malic is the principal acid; in that ripened at high temp. tartaric and citric acids are also formed. The pentosan, pectin, tannin, N, fat, and ester contents of early-ripened are > those of late-ripened fruit. Constituents which normally diminish in amount during ripening do so more rapidly in early- than in late-ripened fruit, whereas those which normally increase do so more rapidly in late-ripened fruit.

A. G. P.

Ripening of rowan berries. R. NUCCORINI [with O. BARTOLI] (Ann. Sperim. agrar., 1935, 17, 73—81; Chem. Zentr., 1936, i, 3763—3764).—The juice of the berries contains glucose, fructose, sucrose, sorbose, and sorbitol. The last is isolated *via* the PhCHO compound after removal of fermentable sugars in the juice by beer yeast.

A. G. P.

Internal mechanism of photoperiodism. A. E. MURNEEK (Ann. Rept. Montana Agric. Exp. Sta. Bull. [1933], 1934, No. 340, 63—64).—As short-day soya bean plants approached the reproductive stage accumulation of N in stems, especially at nodes, increased rapidly. All customary forms of N except NO_3^- were present, the fractions showing the greatest increase being amide-, NH_2 -, and humin-N. In long-day plants little NO_3^- occurred in the tips since in the presence of adequate amounts of labile carbohydrate protein synthesis and the development of vegetative organs were rapid. In the reproductive stage N was rapidly translocated to flowers and fruits and carbohydrates, notably starch, accumulated in the stems. The carotene and xanthophyll contents of short-day were > those of long-day plants.

CH. ABS. (p)

Extrinsic character of oxidations brought about by glucose. L. PLANTEFOL (Compt. rend., 1937, 204, 1886—1888; cf. this vol., 172).—The rate of respiration of *Hypnum triquetrum* is increased by 75% in 0.1N-glucose. After a brief washing with H_2O , the rate returns to the original val., indicating that the effect occurs outside the cell protoplasm.

J. L. D.

Explanation of the induction period in the assimilation of carbon dioxide [by plants]. H. GAFFRON (Naturwiss., 1937, 25, 460—461).—It is suggested that the photo-catalyst in plants forms in the dark a dissociable compound with O_2 which is not photochemically active. This hypothesis explains many of the known facts concerning the induction period which occurs in the process of CO_2 assimilation when plants are removed from darkness into light.

W. O. K.

Plant respiration. VII. Aërobic respiration in barley seedlings: relation to growth and carbohydrate supply. H. R. BARNELL (Proc. Roy. Soc., 1937, B, 123, 321—342; cf. A., 1936, 649).—The respiration rate of whole germinating seedlings is represented by a sigmoid curve with an upper limiting val. at approx. 90 hr., which is maintained until 160 hr. The limiting val. is determined by the amount of carbohydrate translocated from the endosperm. The respiration of isolated embryos declines rapidly from its initial val. to a low starvation level, the reserve of respiratory matter in the embryo

being small. Relations between dry wt. increases and carbohydrate supply are examined.

A. G. P.

Respiration of barley plants. III. Protein catabolism in starving leaves. E. W. YEMM (Proc. Roy. Soc., 1937, B, 123, 243—273; cf. A., 1935, 904).—Hydrolysis of proteins in detached starving leaves is continuous and yields, initially, sol. N compounds, probably NH_2 -acids, glutamine, or peptides. With a decline in carbohydrate (I) concn. further decomp. of N compounds occurs, a stable amide, probably asparagine, being an important product. Extreme depletion of (I) is associated with rapid formation of NH_3 , which may be a proximate cause of the death of the tissue. The mechanism of these changes is discussed.

A. G. P.

Dependence of photoperiodic reactions of plants on the spectral composition of light. V. M. KATUNSKI (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 509—512).—The photoperiodic effect is in the descending order, red, orange, blue, and green light. The magnitude of the effect thus runs parallel with the absorption of the light by the chlorophyll of the leaf.

W. O. K.

Plant growth-stimulating factors. G. SOLLAZZO (Boll. Chim. farm., 1937, 76, 368, 371—373).—Caffeine, NaOBz, malachite-green, Congo-red, and, to a smaller extent, methylene-blue stimulate germination; barbiturates have a retarding action on germination and plant growth.

F. O. H.

Growth of plant embryo *in vitro*. Rôle of accessory substances. J. BONNER and G. AXTMAN (Proc. Nat. Acad. Sci., 1937, 23, 453—457).—Vitamin- B_1 , -C, pantothenic acid, and folliculin promote the growth of pea embryos.

E. M. W.

Effect of hydrogen-ion concentration on the growth of rootlets of the white lupin. Determination of toxic action on the plant cell. J. RÉGNIER, R. DAVID, and R. JORIOT (Compt. rend. Soc. Biol., 1937, 125, 1011—1012).—At $p_{\text{H}} < 3.3$ a retarding action on the differentiation of the various elements of the central cylinder occurs.

H. G. R.

Thiazole and the growth of excised tomato roots. W. J. ROBBINS and M. A. BARTLEY (Proc. Nat. Acad. Sci., 1937, 23, 385—388; cf. this vol., 242).—In a synthetic medium for the growth of excised tomato roots, vitamin- B_1 may be replaced by 4-methyl-5- β -hydroxyethylthiazole with or without 6-amino-2-methyl-5-bromomethylpyrimidine (I) but not by (I) alone (cf. this vol., 405).

A. G. P.

Zonal growth of the *Avena* coleoptile: effect of artificial growth substance. R. POHL (Ber. deut. bot. Ges., 1937, 55, 342—354).—The most readily extensible cells of the coleoptile occupy a zone somewhat below the growing tip. These cells are the most sensitive to the action of β -indolylacetic acid. The physiological condition of the cells and probably their age determine their response to growth substance (I). A quantity of (I) which when applied to the tip causes cell extension retards the growth of the active zone when applied to the base of the coleoptile.

A. G. P.

Influence of several benzene derivatives on the roots of *Lupinus albus*. M. M. CHRYSOSTOM (Amer. J. Bot., 1936, 23, 461—471).—The order of toxicity of substances examined was, PhOH (I) < resorcinol < cresol (II) < pyrogallol; gallic acid < BzOH < salicylic acid; NH_2Ph < NHPhMe . Rise in temp. increased the toxicity of (I), (II), and the amines. Growth of seedlings in solutions of these substances caused an increase in conductance in the case of phenols and amines, a decrease in the case of acids, and a diminution of $[\text{H}^+]$ in nearly all cases.

A. G. P.

Activators of peroxidase in diseased plants. K. SUCHORUKOV and B. STROGOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 15, 563—565).—*Verticillium*, attacking cotton, produces a substance which stimulates peroxidase activity in diseased plants.

A. G. P.

Swiss strawberry-seed oil. J. PRITZKER and R. JUNGKUNZ (Mitt. Lebensm. Hyg., 1937, 28, 12—15).—Two varieties of the dried seeds contained 14.8 and 17.9%, respectively, of oil. The oils had, respectively, butyrefractometer reading at 40° 70.0, 72.0; acid val. 3.7, 10.1; ester val. 184.8, 178.5; sap. val. 188.5, 188.6; I val. 157.7, 165.0; Reichert-Meissl val. 0.66, 0.66; Polenske val. 0.6, 0.6; unsaponifiable matter 1.3, 1.6%; phytosterol < 0.58, 0.56%; solid fatty acids 8.0, 8.6% (Bertram), 5.3, 5.4% (Grossfeld), and isooleic acid 0.7, 0.6%. The respective fatty acids had refraction (40°) 56.2, 57.5; neutralisation val. 194.0, 195.3; mean mol. wt. 289.2, 287.3.

E. C. S.

Fruit of *Sterculia durida*, F. Muell. E. CORSENI and R. INDOVINA (Annali Chim. Appl., 1937, 27, 263—269).—The fruit contains 23.7% of seed, of composition: H_2O 11.35, ash 3.33, N 1.88, P_2O_5 0.92, oil 24.01, cellulose 10.45, starch 15.38, pentosan 8.00, and pectin 1.10% (0.39% sol.). Traces of K, Ca, Al, Mg, Na, Cl, PO_4^{3-} , SO_4^{2-} , and NO_3^- are present in the ash. The oil has d_{20}^{25} 0.9527, m.p. 10—14°, f.p. 3—8°, n_D^{40} 1.4640, butyrefractometer no. 56—58 at 40°, thermo- H_2SO_4 no. 60, acid val. 15, sap. val. 209, Ac val. 38, I val. 84—112, Hehner val. 96, Reichert-Meissl val. 0.33, Polenske val. 0.54, unsaponifiable matter 0.69%. The saturated acids consist of 75% of stearic and 25% of palmitic acid. L. A. O'N.

Canavanine and canaline.—See A., II, 402.

Nitrogenous component of *Sanguinaria canadensis*, L.—See A., II, 429.

Sterol ("sapogenol") from Shoyu oil.—See A., II, 417.

Constituents of *Lecanora sordida*, Th. Fr.—See A., II, 398.

Citraurin from capsanthin.—See A., II, 384.

Neo- α -carotene.—See A., II, 405.

Sapogenins of *Polygala senega*.—See A., II, 427.

Sapogenin of *Gypsophila*.—See A., II, 427.

Lævorotatory isomeride of yohimbine in the bark of *Corynanthe pariculata*, Welnsch.—See A., II, 393.

Alkaloid from the Equisetaceæ family.—See A., II, 393.

Alkaloids of *Lupinus luteus*, Rydl.—See A., II, 434.

Erythroidine, an alkaloid of curare action, from *Erythrina americana*, Mill.—See A., III, 434.

Solanine-s.—See A., II, 435.

Titrimetric determination of sugar. N. FUJII and N. AKUTSU (J. Biochem. Japan, 1937, 25, 237—244).—A modified Benedict's solution is steam-heated in a dish and titrated with the sugar solution.

F. O. H.

Colorimetric determination of carbohydrate in protein molecule. (Modified Sørensen method.) K. KONDO and M. MURAYAMA (J. Agric. Chem. Soc. Japan, 1937, 13, 473—493).—Addition of $\alpha\text{-C}_6\text{H}_4(\text{OH})_2$ to the orcinol- H_2SO_4 reaction mixture (Sørensen) eliminates effects due to interaction with proteins. Hen ovalbumin contains 2.19% of mannose.

J. N. A.

Photometric determination of ammonia.—See A., I, 530.

Determination of phosphatides. Y. SUEYOSHI (J. Biochem. Japan, 1937, 25, 151—155).—The tissue is extracted with $\text{EtOH-Et}_2\text{O}$ and the extract treated with EtOH-CdCl_2 and conc.; 5% aq. NaCl is added to the resulting emulsion and the ppt. is separated, dissolved in EtOH-HCl , and P determined.

F. O. H.

Polarographic determination of disulphide and thiol in biological substances. H. G. ROSENTHAL (Mikrochem., 1937, 22, 233—241).—In presence of Co^{++} salts as catalyst, SH in protein is oxidised by cathodic loss of H^+ in ammoniacal solutions at -1.4 and -1.6 volts and that in cysteine at -1.8 volt. S-S groups undergo prior reduction to SH at lower potentials. The method is applicable to biological fluids and hydrolysis products not containing casein, which inhibits the effect.

J. S. A.

Micro-determination of potassium.—See A., I, 531

Micro-determination of chlorides in biological materials. A. KREYS (J. Biol. Chem., 1937, 119, 389—403).—The method described is based on the Volhard reaction and Laudat's open Carius digestion. 30% H_2O_2 is used for digestion in place of KMnO_4 . 99% recovery of Cl^- is effected with plasma or whole blood by 20 min. digestion at 100°. Limiting errors are discussed.

P. G. M.

Determination of lead in biological material. M. K. HORWITT and G. R. COWGILL (J. Biol. Chem., 1937, 119, 553—564).—Org. matter is destroyed by ignition (which converts Sn^{II} into Sn^{IV}), Pb is extracted with diphenylthiocarbazone (I) in CHCl_3 , and the (I) of the Pb-(I) complex is determined, after removal of the Pb with dil. HCl, by titration with aq. $\text{Pb}(\text{NO}_3)_2$. Sn^{IV} does not interfere. Interference by Bi^{+++} , Ca^{++} , phosphates, and Fe^{+++} is prevented by treatment of the ash with aq. KCN, Na citrate, and $\text{NH}_2\text{OH} + \text{HCl}$, respectively. Blank determinations must be made. With aq. Pb salts < 0.0002 mg. can be determined but with biological material the error may reach 10%.

W. McC.