BRITISH CHEMICAL ABSTRACTS

A., III.—Biochemistry

DECEMBER, 1937.

Optical properties of the red cell membrane. F. O. Schmitt, R. S. Bear, E. Ponder (J. Cell. Comp. Physiol., 1936, **9**, 89—92).—Observations of birefringence in hæmoglobin-free envelopes suggest that these consist of layers of protein mols. with long axes oriented tangentially and interspersed lipin micelles with optical axes oriented radially. M. A. B.

Osmotic properties of the erythrocyte. VIII. Nature of influence of temperature on osmotic hæmolysis. M. H. Jacobs, H. N. Glassman, and A. K. Parpart. **IX. Effect of low concentrations of electrolytes on hæmolysis by penetrating non-electrolytes and on cell volume.** M. H. Jacobs, A. K. Parpart, and S. A. Corson (J. Cell. Comp. Physiol., 1936, **8**, 403—417; 1937, **9**, 177—190; cf. A., 1936, 874).—VIII. The increased resistance of erythrocytes to hæmolysis with rise in temp. is reversible in hypotonic KCl buffered with phosphates at p_H 3. In aq. NaCl there is a rapid loss of the effect in erythrocytes of certain species, possibly due to leakage of $K^{\cdot}$ from the cells. Rise of temp. causes a reversible shrinkage of erythrocytes. These results are best explained on the hypothesis of reversible changes in the base-binding powers of hæmoglobin and H_2CO_3.

IX. The rate of osmotic hæmolysis of ox erythrocytes in glycerol and $(CH_2{\cdot}OH)_2$ solutions is increased by low concns. of electrolytes. Chlorides of Ca, Ba, Sr, and Mg are more effective than those of Na, K, and Li. The effect is ascribed to alteration of the ionic equilibrium in the cell which causes swelling. Na_2SO_4, $MgSO_4$, and Na citrate retard the rate of hæmolysis. M. A. B.

Effect of prolonged exposures to lack of oxygen on permeability of the erythrocyte. F. R. Hunter (J. Cell. Comp. Physiol., 1937, **10**, 241—245).—Permeability of erythrocytes to $(CH_2{\cdot}OH)_2$, glycerol, NH_4Cl, and NH_4OAc is not affected by depriving the cells of O_2 for long periods. M. A. B.

Loss of potassium from the erythrocyte in hypotonic saline. H. Davson (J. Cell. Comp. Physiol., 1937, **10**, 247—264).—The erythrocyte membrane becomes permeable to $K^{\cdot}$ in hypotonic media, permeability increasing with rise of temp. M. A. B.

Rate of sedimentation of erythrocytes. Vernes' reaction, induced hyperthermia, and medicinal injections in man. C. Gernez (Compt. rend. Soc. Biol., 1937, **126**, 50—52).—Intravenous injection of foreign substances causes an increase in the rate of sedimentation and in Vernes' optical index of flocculation, which is more prolonged if the material is pyretic. Very little change is observed on intramuscular injection, the increases being observed only with pyretic substances. H. G. R.

Bovine blood. I. Sedimentation rate and percentage volume of erythrocytes in normal blood. L. C. Ferguson (J. Amer. Vet. Med. Assoc., 1937, **44**, 163—175).—The mean sedimentation index of blood for 22 cows, calc. from the individual means, is 2·394 mm. A val. >4 mm. is regarded as pathological. The mean % vol. of erythrocytes is 31·32%. The relatively high fibrin content of normal bovine serum may account for the slow sedimentation rate. P. W. C.

Effect of ascorbic acid on the sedimentation velocity of erythrocytes. B. Bartolini and F. Copello (Boll. Soc. ital. Biol. sperim., 1937, **12**, 309—311).—Intramuscular injection of 25 mg. of ascorbic acid into rabbits or oral administration of 50 mg. per day to men significantly lowers the rate of sedimentation of the erythrocytes. F. O. H.

Influence of temperature on the sedimentation velocity of erythrocytes. E. Carlinfanti and F. Balestrieri (Boll. Soc. ital. Biol. sperim., 1937, **12**, 389—391).—Erythrocytes from normal men show an increased sedimentation velocity with rise in temp., but those from pathological cases often behave anomalously. F. O. H.

Influence of oxygen tension on cell metabolism and the mechanism of the action of hydrocyanic acid. C. Schlayer (Biochem. Z., 1937, **293**, 94—98).—The action of various [HCN] on the metabolism of goose erythrocytes is investigated at normal and at low O_2 tensions. At normal tensions, inhibition of respiration is accompanied by increased formation of lactic acid (I), but at low O_2 tensions considerable inhibition of respiration is produced without any increase in (I). The appearance of (I) in presence of HCN is therefore not conditioned by the depressed respiration, but by a direct action of HCN on the fermentation. P. W. C.

High urea content of the red blood corpuscles of *Sipunculus*. M. Florkin and R. Houet (Arch. Internat. Physiol., 1937, **45**, 125—127).—The cœlomic fluid of red corpuscles has a high urea content; the plasma and white corpuscles contain practically none. R. M. M. O.

Chemotactic reaction of leucocytes to irritated tissues. C. G. Grand and R. Chambers (J. Cell. Comp. Physiol., 1936, **9**, 165—175).—Leucocytes are not attracted to uninjured, healthy tissues or to

normal peritoneal fluid, but infected or mechanically injured tissues produce a positively chemotactic substance, which is destroyed by heat. The chemotactic substance produced by *Staphylococcus* grown in broth is thermostable. M. A. B.

Osmotic properties of rabbit and human leucocytes. H. SHAPIRO and A. K. PARPART (J. Cell. Comp. Physiol., 1937, **10**, 147—163).—The kinetics of swelling and shrinking of human and rabbit leucocytes are examined. Data obtained indicate the permeability consts. for endosmosis to be 1·35 for human and 0·29 for rabbit leucocytes. The consts. for exosmosis are about four times those for endosmosis. M. A. B.

Reticulocytosis in the guinea-pig. I. Use of standard guinea-pigs in assay of anahæmin. II. Hæmatopoietic response of "reactive" guinea-pigs to anahæmin and other substances. M. M. O. BARRIE (J. Pharm. Exp. Ther., 1937, **60**, 235—244, 245—253).—I. Guinea-pigs of different stocks show considerable variation in reticulocytosis whilst those from the same stock show less variation and are separable into groups with different average reticulocyte counts. A method of assay for liver preps., using suitable groups of guinea-pigs, is suggested.

II. A reticulocyte response is produced in "reactive" guinea-pigs by histidine hydrochloride and by HCl but the response to anahæmin (a conc. liver prep.) is very much greater. E. M. W.

Ultramicroscopic particles in normal human blood. A. C. FRAZER and H. C. STEWART (J. Physiol., 1937, **90**, 18—30).—The no. of particles visible under the dark-ground condenser in the serum of normal human subjects is increased by ingestion of fatty food. The time curves after a meal are similar for particles of all types, and have two components; an initial rise is due to intestinal movements and fat from the previous meal, whilst a delayed rise represents fat actually absorbed. Blood-fat rises and falls simultaneously with the particle content, whilst cholesterol rises and remains high. Protein meals cause no significant variations in the particle content, whilst a pure carbohydrate meal causes a rapid fall. R. N. C.

Hæmoglobin in the Amphibia. F. H. MCCUTCHEON and F. G. HALL (J. Cell. Comp. Physiol., 1937, **9**, 191—197).—The type of hæmoglobin varies with species as shown by differences in the dissociation curves. M. A. B.

Hæmoglobin and chlorophyll. ANON. (Contact Point, 1935, **13**, 5—9).—The porphyrin ring is both strainless and flat. A connexion between the oscillation of the relatively heavy metal atom and the shift of the H atoms and double linkings is discussed and utilised to explain the physiological activity of these compounds. CH. ABS. (*p*)

Reaction between arsenic trihydride and hæmoglobin. F. GEBERT (Biochem. Z., 1937, **293**, 157—186; cf. Wolff, A., 1937, III, 29).—The solubility of AsH_3 in physiological aq. NaCl, fresh and old blood-serum, protein solution, and buffer solutions is the same as in H_2O and $\propto$ pressure. AsH_3 is insol. in conc. aq. NaOH and the solubility in acids (HCl, H_3PO_4) decreases as the concn. of acid increases. Hæmatin (I) reacts irreversibly with AsH_3, (I) being partly converted into hæm. Erythrocytes containing no oxyhæmoglobin and CO-hæmoglobin combine with AsH_3; no combination occurs if the erythrocytes are first treated with $Na_2S_2O_4$. The combination with erythrocytes is due not to hæmoglobin (II) but probably to methæmoglobin produced by autoxidation of (II). (I) and (II) catalyse the oxidation of AsH_3 by O_2. HCl inhibits catalysis by (I) and CO and KCN inhibit catalysis by (II). The first product of the oxidation is probably As_2H_4. W. McC.

Relation of blood-cholesterol to hæmoglobin and serum-protein. H. SCHWARZ and H. H. LICHTENBERG (J. Biol. Chem., 1937, **121**, 315—321).—In rabbits rendered anæmic by bleeding daily blood-cholesterol (I) increases and -hæmoglobin (II) decreases, the serum-protein (III) remaining unchanged even when the bleedings are followed by injection of serum. When bleeding and injection of serum are prolonged for >40 days (II) increases considerably and (I) decreases to approx. the initial val. Administration of egg-yolks results in lipæmia and increase in (I), (II) and (III) remaining unchanged. Since the anæmic rabbits have fatty livers, the resulting disturbance of lipin metabolism may be the cause of the lipæmia and of the increased (I). The latter does not result from synthesis of (III) produced to compensate for loss of (III) on bleeding. W. McC.

Comparative investigation of methods of determining hæmoglobin in blood. W. WEISE (Biochem. Z., 1937, **293**, 64—93).—A spectral colorimetric method for determination of hæmoglobin (I) as reduced (I) is described, and is shown to give trustworthy results and good agreement with results by gas analysis. A similar method for determination of hæmatin is described and also iodometric and colorimetric methods for determination of Fe in 1—2 c.c. of blood. The (I) content can be calc. from the Fe content with considerable accuracy. Comparative tests by these methods with 25 samples of whole blood gave results showing good agreement. P. W. C.

Biological oxidations. VIII. Oxidation of glutathione with copper and hæmochromogens as catalysts. IX. Oxidation–reduction potentials of blood-hæmin and its hæmochromogens. E. S. G. BARRON (J. Biol. Chem., 1937, **121**, 275—284, 285—312; cf. A., 1937, III, 77).—VIII. The oxidation of glutathione (I) by atm. O_2 is catalysed by Cu, the rate of oxidation being greater at higher p_H vals. A linear relationship exists between p_H and log of half-oxidation time. The rate of oxidation is unaffected by the degree of Cu ionisation. With hæmin as catalyst, the rate of oxidation of (I), which shows an optimum at p_H 8, is insensitive to HCN except at high [HCN]. At p_H 7·4, the catalytic activity of pyridine-, nicotine-, and pilocarpine-hæmochromogen decreases in this order.

IX. The oxidation–reduction potentials, E_0, of blood hæmin and of hæmochromogens in which the

affinity of the nitrogenous constituent for hæmin is low, *e.g.*, pyridine-, α-picoline-, and nicotine-hæmochromogen, vary with p_H, the val. of $-dE_0/dp_H$ being 0·06 v. per p_H unit. With increasing affinity of the nitrogenous constituent the val. of $-dE_0/dp_H$ decreases, being 0·015 v. per p_H unit for pilocarpine- and histidine- and zero for cyanide-hæmochromogen. C. R. H.

Spectroscopic determination of bilirubin in serum. J. Henry-Cornet and L. Henry (Bull. Acad. roy. Belg., 1937, [v], **23**, 697—702; cf. A., 1936, 1048).—Bilirubin (I) from different sources, when dissolved in alkali or aq. EtOH, gives the same absorption spectrum, the extinction coeff. of which is used to determine the concn. of (I) in serum deproteinised with EtOH. J. L. D.

Mixtures of serum-albumin and -globulin. A. G. Ogston (Biochem. J., 1937, **31**, 1952—1957).—The osmotic pressure, ultra-violet absorption, pptn. reactions, and potentiometric titration of the two proteins (man, horse) and their mixtures do not elucidate the phenomenon of apparent dissociation occurring during sedimentation of mixed proteins (cf. Pedersen, A., 1936, 1338). F. O. H.

Effect of infra-red rays on the post-traumatic blood-polypeptide curve in guinea-pigs. P. Etienne-Martin and P. Plan (Compt. rend. Soc. Biol., 1937, **126**, 9—11).—The increase in polypeptides caused by trauma is less marked after infra-red irradiation. H. G. R.

Histamine-like activity of blood. C. F. Code and A. D. Macdonald (Lancet, 1937, **233**, 730—733).—Mainly a discussion of previous work. Histamine (I) appears to be a normal constituent of the white blood-cells. In myeloid leucæmia blood-(I) is greatly increased, and the increase appears to be fixed in the white cell layer. L. S. T.

Alterations of blood-amino-acids in pathological conditions. M. R. Castex and P. M. Re (Presa med. Argentina, 1931, Apr. 10, 46 pp. [Sep.]).—Normal blood-NH_2-acids range between 55 and 65 mg. of N per litre. Vals. obtained in $CCl_3{\cdot}CO_2H$ filtrates are > those given by Folin's tungstic acid method, especially in cancer, leucæmia, and $CHCl_3$ poisoning. Ch. Abs. (*p*)

Composition of the blood-plasma in adult insects. M. Florkin (Arch. Internat. Physiol., 1937, **45**, 6—16; cf. A., 1937, III, 53, 84).—The blood-protein and -sugar of *Hydrophilus piceus* and *Bombyx mori* are similar to, whereas reducing-non-fermentable substances, uric and NH_2-acids are >, those of decapodal crustaceans. *Hydrophilus* blood contains O_2 and the CO_2 content is high (72·8—88·8 vol.-%). H. G. R.

Plasma-lipins in actively immunised rabbits. E. M. Boyd, J. H. Orr, and G. B. Reed (Canad. J. Res., 1937, **15**, D, 176—178).—No significant change occurred in the phospholipin or free cholesterol contents of the plasma after 6 weeks' active immunisation against *Streptococcus viridans*. A. G. P.

Variations in the composition of the blood-plasma during metamorphosis of the silkworm. M. Florkin (Arch. Internat. Physiol., 1937, **45**, 17—31).—In the period from the commencement of spinning to the grub stage an increase in glycogen and a decrease in lipins were observed. Dilution of the blood occurs in the spinning stage, and concn. during the pre-grub resting period. In the chrysalis two phases are observed corresponding with a diminution and augmentation of CO_2. H. G. R.

Determination of cholesterol in blood. J. B. de Mello (Rev. quim. farm. Brazil, 1935, **1**, 49—50).—The EtOH–Et_2O mixture used in Sackett's method is best kept anhyd. by means of $CuSO_4$. A second washing (5 c.c.) is preferable after decantation. Vac. distillation of the solvent is recommended, since heating affects the colour. Ch. Abs. (*p*)

Cholesterolæmia in normal and diabetic Indian subjects. J. P. Bose and U. N. De (Indian J. Med. Res., 1936, **24**, 489—508).—Blood-cholesterol (I) in normal subjects ranges from 120 to 160 mg. %. It is apparently unaffected by race *per se*. (I) in diabetics shows very little relation to the degree of hyperglycæmia, although this may be moderate in cases where (I) is high, and high where (I) is normal. (I) is a more satisfactory index of the severity of the diabetic condition than hyperglycæmia or any other factor. R. N. C.

Acetylcholine in blood. A. Fleisch, I. Sibul, and M. Kaelin (Arch. Internat. Physiol., 1936, **44**, 24—34).—Acetylcholine is never present in normal venous blood, but appears if the blood pressure is lowered. H. G. R.

Phenol and glyoxaline content of the blood. E. G. Schmidt, M. J. Schmulovitz, A. Szczpinski, and H. B. Wylie (J. Biol. Chem., 1937, **120**, 705—717).—Determination of the "diazo-val." of blood by three methods shows that <1% of the total val. is made up of Et_2O-sol. phenols, the remainder being due presumably to N compounds. Differences in the diazo-val. are obtained by using p-$NH_2{\cdot}C_6H_4{\cdot}NO_2$ and p-$NH_2{\cdot}C_6H_4{\cdot}SO_3H$ as reagents. The use of histidine instead of PhOH for the colour standard is suggested. A. L.

Determination of phenols in blood. A. F. Arnaudo (Prensa med. Argentina, 1934, Aug. 8th, 55 pp. [Sep.]).—A review. Theis and Benedict's method is recommended. Ch. Abs. (*p*)

Effect of vagotomy on blood-sugar curves produced by glucose or insulin. A. O. Etcheverry (Compt. rend. Soc. Biol., 1937, **126**, 147—149).—The vagus augments secretion of insulin during hyperglycæmia and diminishes it during hypoglycæmia. H. G. R.

Normal and alimentary blood-sugar levels during menstruation. R. Romaniello (Boll. Soc. ital. Biol. sperim., 1937, **12**, 352—353).—Both levels are max. and min. during the menstrual and intermediate periods, respectively. F. O. H.

Self-regulation of blood-glycolysis and coupling of its chief oxido-reduction process with the synthesis of difficultly hydrolysable phosphoric esters. Z. Dische (Naturwiss., 1937, **25**, 650—651).—Human erythrocytes incubated with glucose

and then hæmolysed cause hexose diphosphate to disappear more slowly than when glucose is absent. The effect is due to an increase in the dehydrogenase activity which increases the rate of the reaction between $AcCO_2H$ and triose phosphate (I). The reaction of (I) and $AcCO_2H$ in presence of hæmolysate is coupled with the esterification of inorg. P, resulting in an increase of P_2O_7''''-P (II) and also of difficultly hydrolysable phosphate; in presence of adenylic acid, however, only (II) increases. The theoretical significance of these results is discussed with special reference to the possible activation during incubation of an inactive precursor of the co-enzyme. W. O. K.

Oxidation-reduction potential of serum and of the dehydroascorbic-ascorbic acid system. B. Bartolini (Boll. Soc. ital. Biol. sperim., 1937, **12**, 303—305).—Serum oxidises ascorbic acid (I) to dehydroascorbic acid (II) or reduces (II) to (I), the ratio (I) : (II), which is affected by p_H and exposure to light, affording an index of the oxidation-reduction potential of the serum. F. O. H.

Electrometric determination of esterase activity of blood. C. Cattaneo and G. Scoz (Boll. Soc. ital. Biol. sperim., 1937, **12**, 280—281).—The esterase activity is measured by the vol. of 0·05N-NaOH required to adjust the p_H of a system containing tributyrin (1 c.c.), 2% aq. $CaCl_2$ (0·5 c.c.), NH_3–NH_4Cl buffer at p_H 8 (2·5 c.c.), and the sample of serum (1 c.c.), kept at 37·5° for 1 hr., to its original val. F. O. H.

Effect of the lung on the lactic acid content of the blood. H. Rosenbaum (Arch. Internat. Physiol., 1937, **45**, 75—83).—The lactic acid content of venous is > that of arterial blood. H. G. R.

Rate of removal of urea by living blood capillaries from extravascular solutions in transparent moat chambers introduced into the rabbit's ear. R. G. Abell (Anat. Rec., 1937, **69**, 11—31).—The rate of removal follows the law of simple diffusion, and ∝ the concn. gradient. The rate of decrease in concn. in the extravascular solution due to diffusion ∝ the concn. gradient and the absorbing capillary area, and inversely ∝ the vol. of the solution. R. N. C.

Effect of calcium salts on the fat content of the blood. W. von Moraczewski and H. Jankowski (Biochem. Z., 1937, **293**, 187—191; cf. A., 1931, 1086).—In man and in the dog increase of short duration in the fat and cholesterol contents of the blood follows oral or intravenous administration of Ca salts [$CaCl_2$, $Ca_3(PO_4)_2$] or injection of parathyroid extract. The action of less sol. is more prolonged than that of more sol. Ca salts. W. McC.

Effect of hydrogen-ion concentration on determination of calcium in blood-serum–phosphomolybdic acid centrifugates. J. H. Defandorf (J. Lab. Clin. Med., 1935, **21**, 65—67).—Hermann's method (1932) is unsatisfactory for determining Ca not bound to protein. Addition of definite quantities of phosphomolybdic acid does not always produce the [$H^·$] necessary for complete pptn. of protein. Vals. given by $KMnO_4$ titration are too high if protein is incompletely pptd. or if bound Ca is separated from protein by a [$H^·$] > the min. required for complete pptn. of protein. Ch. Abs. (p)

Micro-determination of sulphur in normal blood-serum. L. Révol (Compt. rend. Soc. Biol., 1937, **126**, 22—24).—The method of Révol and Ferrand (A., 1936, 126) has been applied. The average vals. of total and non-protein-S for normal serum are 1190 and 62 mg. per litre, respectively. H. G. R.

Various forms of sulphur in therapeutic sera. Determination of inorganic sulphur. L. Révol and L. Trouillas (Compt. rend. Soc. Biol., 1937, **126**, 24—25).—No variation in the distribution of S between normal and therapeutic horse sera was observed. Horse serum contains less total S (1 g. per litre) but more non-protein (190 mg. per litre) and inorg. S (64—72 mg. per litre) than human sera. H. G. R.

[Simulation of] post-operative hypochloræmia [by injection of muscle extract]. A. Salvatori (Atti R. Accad. Lincei, 1937, [vi], **25**, 404—412).—Aq. muscle extract injected into the gluteal region of adult rats causes hypochloræmia (in 7 out of 10), and an increase in non-protein-N in the blood. This supports the view that post-operative hypochloræmia is due to the liberation of toxic N compounds in the traumatised tissues. There is, however, no apparent proportionality between the amount of the injection and the degree of hypochloræmia. E. W. W.

Iodine content of blood. E. J. Baumann and N. Metzger (J. Biol. Chem., 1937, **121**, 231—234; cf. A., 1933, 198).—Blood-I is determined by digesting with CrO_3 and H_2SO_4, adding a large amount of $H_2C_2O_4$, and distilling in a slow current of air. The distillate is collected in aq. KOH, concentrated, neutralised, treated with Br, and titrated with 0·001N-$Na_2S_2O_3$. Vals. for healthy men averaged 0·0035 and for women 0·0026 mg. per 100 c.c. The val. is not affected by administration of thyroid gland but in Graves' disease and in health is increased (sometimes very greatly) by administration of I or KI. W. McC.

Blood-iodine. T. Leipert (Biochem. Z., 1937, **293**, 99—106).—A method for determining various fractions of blood-I is described. Iodised protein is separated by ultrafiltration and the inorg. I of the ultrafiltrate removed by Ag_2SO_4. In blood ultrafiltrate, 1—3 × 10^{-6}% of I is present in org. combination. Its importance is discussed. P. W. C.

Microchemical reactions for detecting constituents of blood and urine. K. Nosaka (Mikrochim. Acta, 1937, **1**, 78—82).—Blood in urine is detected by treating a drop of urine, on filter-paper, with H_2O_2 and benzidine; the sensitivity is augmented by adding a drop of NaOH. Tyrosine in urine or serum is detected by the purple colour produced on deproteinising with $CCl_3·CO_2H$, and treating the solution with 1 : 2-$NO·C_{10}H_6·OH$. Leucine is similarly detected by the characteristic habit of the cryst. compound formed with $Cu(OAc)_2$. Urine is first decolorised with C; serum, or urine containing protein, is treated as above. J. S. A.

Congo-red test for amyloidosis. M. M. Friedman and O. Auerbach (J. Lab. Clin. Med., 1935,

21, 93—94).—Blood samples are taken 4 min. and 1 hr. after injection of Congo-red. Hæmoglobin is removed by addition of four times the vol. of EtOH and the extent of the dye adsorption judged colorimetrically from the two samples. Ch. Abs. (*p*)

Suitability of the corneal epithelium of the frog for the detection of mitogenetic radiation from the blood. W. Brenner (Biochem. Z., 1937, 292, 424—433).—Variations in response indicate that the frog's corneal epithelium is unsuitable. F. O. H.

Heart–lung–kidney preparation with coagulable blood. L. Brull (Arch. Internat. Physiol., 1936, 44, 1—14).—Utilisation of a second heart–lung prep. overcomes the lack of a reserve of venous blood. With this prep. the non-protein-N of the blood is conc. 10—12-fold by the kidney and urinary Cl and P are > when using defibrinated blood, although these are not excreted at a concn. > that of the plasma. H. G. R.

Blood-groups of Veddahs. W. C. O. Hill (Nature, 1937, 140, 548).—Blood-groups of Ceylonese peoples are tabulated. L. S. T.

Photodynamic hæmolysis. I. Effect of dye concentration and temperature. H. F. Blum, N. Pace, and R. L. Garrett. **II. Modes of inhibition.** H. F. Blum (J. Cell. Comp. Physiol., 1937, 9, 217—228, 229—239).—Rose-bengal (I) in low concn. causes true photodynamic hæmolysis with a temp. coeff. of 1·2. In high concn. it produces hæmolysis in the dark and, in this case, the effect of temp. is irregular.

II. Photodynamic hæmolysis by (I) is inhibited by SO_3'', S_2O_3'', blood-plasma, phenosafranine (II), tryptophan (III), and histidine (IV). Plasma, (II), (III), and (IV) also inhibit hæmolysis in the dark. Inhibition results from (*a*) interference with the photo-oxidation process, either by removal of O_2 or by introduction of reducing substances, (*b*) introduction of substances which prevent the combination of the dye with the cells. (*a*) will inhibit only photodynamic hæmolysis; (*b*) will inhibit hæmolysis both in the light and in the dark. M. A. B.

Intensified hæmolysis. P. Neuda (Z. Immunitäts., 1937, 91, 112—133).—Human serum contains a "normal" lysing agent the action of which is weakened by addition of lecithin (I) to the serum. When (I) is added to the red corpuscles lysis is increased. This agent is most active at low temp., and is thermostable. The optimum dilution is 1 : 16 to 1 : 64. C. R. S.

Hæmolysis by the venom of the Indian cobra (*Naja tripudians*). S. N. Ganguly (Indian J. Med. Res., 1937, 24, 1165—1174).—The hæmolytic action is associated with a fraction of the venom containing globulin and primary proteose, and accompanied by lecithinase. The % hæmolysis of whole blood by the fraction is roughly inversely ∝ the cholesterol (I) content. Hæmolysis in general is slight when (I) is ≫ lecithin; this relationship is not shown in the case of washed cells. R. N. C.

Chemistry of moccasin [snake-]venom. I. Hæmorrhagic and hæmolytic components. S. M. Peck and W. Marx (J. Pharm. Exp. Ther., 1937, 60, 358—368).—Tests for hæmorrhagin (I) and hæmolysin (II) in the venom are described. The optimum p_H for (I) is 6·0—8·0 and that for (II) 5·0—7·0. Incubation for 3 hr. at 60° destroys (I) and (II), at 37° (II) only. E. M. W.

Preservation of coagulant solutions of daboia-venom. J. Taylor, S. M. K. Mallick, and S. N. Ganguly (Indian J. Med. Res., 1936, 24, 521—524).—The venom may be preserved by 50% glycerol. R. N. C.

Coagulability of blood from the site of surgical lesions. I. Scalone (Riv. Biol., 1937, 23, 89—127).—The main factor in the increase in coagulability of blood from the site of various types of trauma in men and animals is blood stasis in the vessels. Inflammation and sepsis, but not inoculation or absorption of neoplastic tissue, increase the rate of coagulation. The relationships of coagulability to various pathological conditions are discussed. F. O. H.

Action of hydrotropic substances on fibrinogen and blood-clotting. I. Meissner and E. Wöhlisch (Biochem. Z., 1937, 293, 133—141).—Addition of various hydrotropic substances, *e.g.*, urea, NaOBz, and Na hippurate, to fibrinogen (I) solutions decreases, and of Na salicylate in small concns. increases, but with higher concns. decreases, their turbidity. The action is reversible. Urea in high concns. retards the spontaneous denaturation of (I) and the clotting of (I) by thrombin, whilst various hydrotropic substances retard the pptn. of (I) by EtOH, tannin, NaCl, AcOH, and heat. With EtOH, tannin, and heat, the effect is a delay of flocculation and not of denaturation. Urea does not inhibit the hydrolysis of (I) by pepsin and trypsin. P. W. C.

Clotting time of blood following administration of histidine. L. Bloch, J. Kosse, and H. Necheles (J. Amer. Med. Assoc., 1937, 109, 204).—Histidine has no effect on blood clotting time and its therapeutic use in bleeding peptic ulcers cannot be justified. J. N. A.

Anticoagulants. T. Magath and M. Hurn (Amer. J. Clin. Path., 1935, 5, 548—567).—Heparin (I) causes no crenation or swelling of erythrocytes. Dry oxalate (22 mg. per 10 c.c. of blood) causes 11·3% shrinkage. Use of 1 c.c. of 1·1% aq. $Na_2C_2O_4$ per 5 c.c. of blood leads to hæmatocrit readings agreeing with those obtained with (I), provided blood is centrifuged within 2 hr. Ch. Abs. (*p*)

Complement content of sera of the new-born, infants, and fœtus. P. Sölling (Z. Immunitäts., 1937, 91, 15—21).—The hæmolytic complement val. was const. in the case of 20 infants in their first year and 93 new-born, in which it was < in healthy men. The complement could be detected from the 17th week of fœtal life, but had a low val. After the 28th week it had risen to that of a new-born infant. C. R. S.

Interpretation of secretion and non-secretion of substances belonging to serological groups. V. Friedenreich (Z. Immunitäts., 1937, 91, 39—49).—An *A*-substance is found in the saliva of some

but not of all horses. It is never found in red corpuscles. C. R. S.

Toxin of *Bacterium coli*. II. Immunising power of the polysaccharide and the curve of the agglutination titre. III. Action of anti-polysaccharide serum on the polysaccharide and on the living bacteria. A. Ligas (Boll. Soc. ital. Biol. sperim., 1937, **12**, 297—298, 298—299; cf. A., 1937, III, 397).—II. Data are given for the febrile reaction, agglutinin titre of the serum, and bactericidal power of rabbit blood following intravenous injection of the polysaccharide (I).

III. The antipolysaccharide serum probably contains an antibody which diminishes the toxic action of (I) and of the living bacteria. F. O. H.

Detoxication of diphtheria toxin by lanoline and sterols; influence of cholesterol on its immunising power. II. M. Eisler and F. Gottdenker (Z. Immunitäts., 1937, **91**, 49—61).—The toxin previously neutralised by combination with cholesterol (I) regains its toxicity when the (I) is extracted with $CHCl_3$. Rabbits can decompose this combination. Neutralisation of the toxin by (I) depends on the ratio of their vols. and on the period of reaction allowed. The quantity of antitoxin formed increased after injection, simultaneous or separate, of toxin and (I). C. R. S.

Highly purified diphtheria antigen. H. Theorell and G. Norlin (Z. Immunitäts., 1937, **91**, 62—68).—Cataphoresis shows that the flocculating antigen purified by repeated pptn. is a protein, giving a negative Molisch reaction. C. R. S.

Evaluation of the toxoid of staphylococci. H. Schmidt (Z. Immunitäts., 1937, **91**, 75—86).—If a toxin-antitoxin mixture is added to the toxoid, part of the antitoxin is fixed and the amount may be measured by the hæmolytic effect of the freed toxin on the red corpuscles of rabbits. C. R. S.

Hæmagglutination with night birds of prey (Strigidæ, owls). P. Dahr (Z. Immunitäts., 1937, **91**, 97—111).—No isoagglutination among owls was found; the sera contain anti-species agglutinins or type-sp. agglutinins α and β as shown by their behaviour towards human red corpuscles. Owl corpuscles have not *A*, *B*, *M*, or *N* factors. C. R. S.

Autoagglutination. E. Poulsen (Z. Immunitäts., 1937, **91**, 134—144).—Reports that sera of patients with cancer, thrombophlebitis, etc. show autoagglutination could not be confirmed. C. R. S.

Production of "purified" solutions of hæmagglutinins. P. Dahr (Z. Immunitäts., 1937, **91**, 149—153).—A simple process is described. C. R. S.

Slow-drying antigen for the *Brucella* rapid agglutination test. I. F. Huddleson (J. Amer. Vet. Med. Assoc., 1937, **43**, 519—520).—The ordinary antigen is modified by the incorporation of glycerol. W. O. K.

Antigenic value of purified serum-proteins. S. Stetkiewicz (Compt. rend. Soc. Biol., 1937, **126**, 141—142).—The globulin fraction gives better results than the albumin, and the purified proteins, being less toxic, can be given in larger doses. H. G. R.

Preparation of Krueger undenatured bacterial antigens. H. M. Powell and W. A. Jamieson (J. Lab. Clin. Med., 1935, **21**, 301—307).—Krueger's method is adapted for large-scale production of the antigens. Methods of standardising the products are given. Ch. Abs. (*p*)

Effect of disinfectants on different receptors. K. Aoki (Z. Immunitäts., 1937, **91**, 87—96).—Absorption and immunising effects show that the β-sp. receptors are more sensitive than the β-unsp. ones, whilst the α-receptors are intermediate in their resistance towards heat or treatment with disinfectants. C. R. S.

Antitoxic properties of glutathione. Cobra venom. L. Binet, G. Weller, and C. Jaulmes (Compt. rend., 1937, **204**, 1513—1514).—Development of symptoms is retarded and the animals occasionally survive normally lethal doses, if the venom before injection is mixed with reduced glutathione at p_H 7·4—8·4; at p_H <7·4, animals die but less rapidly than the controls. R. M. M. O.

Serological effect and composition of proteins of some filtrates of immune sera. S. Went and L. Sarkady (Z. Immunitäts., 1937, **91**, 157—164).—Immune sera after ultrafiltration show altered dispersibility. No relation could be found between immunising agent and coarsely dispersed proteins of the sera. C. R. S.

Chemical and immunological mechanism of anthrax infection and immunity. I. G. Iványovics and V. Bruckner (Z. Immunitäts., 1937, **91**, 175—176; cf. A., III, 294).—The acid found in the sp. substance is *d*(−)-glutamic acid. C. R. S.

Rabicidal substances in treated patients. J. Dodero (Ann. Inst. Pasteur, 1937, **59**, 382—402).—Substances appear transitorily in the serum during treatment. Their presence is indicated by a prolonged incubation period or survival in animals injected with the serum. The extent of their formation depends on the individual and probably also on manner of treatment. No clear relation emerges between these substances and the protective affect of the treatment. R. M. M. O.

Destruction of anaphylactic supersensitiveness to azoprotein by azo-dyes from *p*-aminophenylarsinic acid.—See A., II, 528.

Changes in human tissue electrolytes in senescence. H. S. Simms and A. Stolman (Science, 1937, **86**, 269—270).—Human tissues > 70 years of age contained more H_2O, Cl, total base, Na, and Ca and less K, Mg, P, N, and ash than tissues 30—40 years of age. Pathological abnormalities in young tissue were similar to but less marked than those of senescence. Ca variations were exceptional. L. S. T.

Distribution of chloride in frog's skeletal muscle immersed in saline solution. M. G. Eggleton, P. Eggleton, and A. M. Hamilton (J. Physiol., 1937, **90**, 167—182).—[Cl′] in isolated muscle in equilibrium with Ringer's solutions of

const. [Cl′] but varying osmotic pressure is inversely ∝ [H_2O]. The [Cl′] ratio between muscle and isotonic Ringer's solution is const. for all [Cl′] vals. in the latter between 0·5 and 4·4 mg. per c.c.; it is 0·24 in living muscle, and 0·85 in rigor. It is concluded that only a quarter of the muscle is permeable to Cl′. An electrometric titration method for determination of Cl′ is described; it can be applied to CCl_3·CO_2H filtrates of tissues and is not interfered with by glycogen, protein, or other N compounds of muscle. R. N. C.

Determination of iodine in thyroid gland. J. C. DE JONG (Pharm. Weekblad, 1937, **74**, 1429—1437).—200 mg. of the powdered gland are dissolved in 5 c.c. of warm 4N-NaOH, 200 mg. of talc, 50 c.c. of 4% aq. $KMnO_4$, and 25 c.c. of 4N-H_2SO_4 are added. The mixture is warmed until it foams and, after the initial reaction, gently boiled for 5 min. to complete oxidation. The cooled solution is treated with an excess (3 g.) of $NaHSO_3$ and 3 c.c. of 0·1N-$AgNO_3$, boiled free from SO_2, and 15 c.c. of 50% HNO_3 are added. The ppt. of AgI and talc is washed on a hardened filter and transferred to a flask with 75 c.c. of H_2O. I′ is oxidised to IO_3′ with 5 c.c. of dil. H_2SO_4 and 10 c.c. of Br–H_2O. The excess of Br is removed by boiling, 5 c.c. of 1% aq. PhOH and a few crystals of KI are added, and the liberated I is titrated with 0·01N-$Na_2S_2O_3$ (1 c.c. ≡ 0·212 mg. I). The method compares favourably with the standard method. Several commercial samples analysed did not fulfil the requirements of the Dutch Pharmacopœia. S. C.

Fluorine in dental enamel. A. BERNARDI and L. SCANDOLA (Annali Chim. Appl., 1937, **27**, 328—332).—Qual. analysis by the $La(OAc)_3$ method indicates the occurrence of F in dental enamel (man, ox); the average content is 0·38 and 0·54%, respectively. F. O. H.

Chemical constitution of enamel and dentine. I. Principal components. W. D. ARMSTRONG and P. J. BREKHUS (J. Biol. Chem., 1937, **120**, 677—687).—Analytical vals. are reported for the mineral constituents of enamel and dentine. The Mg and CO_3″ contents of dentine being > those in enamel indicate the non-identity of the two mineral phases. The composition of the enamel of carious teeth is similar to that of sound teeth, and the composition of the enamel from the teeth of one individual varies as much as that obtained from the teeth of several. A. L.

Natural occurrence of zinc in teeth. II. Some general considerations. D. B. CRUICKSHANK (Brit. Dental J., 1937, **63**, 395—399).—Of all human organs, the teeth have the highest concn. of Zn (200 mg. per kg.). W. O. K.

Copper, zinc, and cobalt in organs of lamellibranchs. R. PAULAIS (Compt. rend., 1937, **204**, 1508—1510).—Zn, Cu, and, in most cases, Co were found in the species examined. R. M. M. O.

Radioactivity of potassium prepared from animal tissue.—See A., I, 489.

Micro-determination of chloroform extract of beet leafhopper. R. A. FULTON (Ind. Eng. Chem., Anal.], 1937, **9**, 437—438).—An apparatus for quant. extraction of small wts. of the insects with $CHCl_3$ is described. Dried *Eutettix tenellus* from four host plants contained 34·5—42·7% of $CHCl_3$-sol. material. R. S. C.

Liver-lipins in normal dogs on different types of fat, with and without added lecithin. S. H. RUBIN, C. H. PRESENT, and E. P. RALLI (J. Biol. Chem., 1937, **121**, 19—26).—When divided into five classes according to the type of fat added to the basal diet, the total lipins and the individual fractions (unsaponifiable, total acids, phospholipin, free and esterified cholesterol, neutral fat) of the livers of 33 normal dogs, determined by microgravimetric methods, show no significant differences (except for the I val. of the total fatty acids) amongst the classes. P. W. C.

Solubility of cholesterol in bile-salt solutions. J. T. BASHOUR and L. BAUMAN (J. Biol. Chem., 1937, **121**, 1—3).—The solubility of cholesterol in bile-salt solutions increases with increase in concn. of the latter to max. vals., which are more rapidly attained with deoxycholates than with cholates. Solutions of unconjugated salts appear to be better solvents than those of conjugated salts. Coupling with NH_2-acids decreases the solvent effect of cholic and deoxycholic acids. C. R. H.

Absorption spectra of compounds related to the sterols.—See A., I., 494.

Glutamic acid. I—IV. B. ROKUSHO, R. TANAKA, and H. SAITO (J. Agric. Chem. Soc. Japan, 1937, **13**, 916—953).—The relationship between [HCl], time of decomp., and rate of hydrolysis of a soya-bean protein prep. in regard to total and NH_2-N in the hydrolysate has been determined. The optimum conditions for obtaining glutamic acid (I) (97—99% purity) from the prep. have been determined. (I) is liberated more slowly from the protein mol. than are the other NH_2-acids. The yield of (I) from various oil cakes produced in Manchuria is given. J. N. A.

Determination of proline in gelatin. A. BASTIAN (Bull. Soc. Chim. biol., 1937, **19**, 1298—1301).—The proline content of gelatin determined in the hydrolysate by the method of Engeland and Bastian (A., 1937, III, 374), which uses only 2 g. of protein, is 25—26·5% and compares favourably with the val. of 20% obtained by Bergmann's method (A., 1935, 1140), which requires 100 g. of protein. P. W. C.

Protamine of the rainbow trout. K. FELIX and A. MAGER (Z. physiol. Chem., 1937, **249**, 124—125; cf. A., 1936, 1544).—The Me ester hydrochloride of the impure protamine, iridin, mol. wt. approx. 1560, of the spermatozoa of the rainbow trout contains total N 22·3, Cl 14·15, and OMe 1·98%. The total N is distributed as follows: as arginine 86·95, $(NH_2)_1$-acid 13·7, alanine 2·08, serine 2·02, :NH 6·11, and valine 3·50%. W. McC.

Compounds of clupein with prosthetic groups. K. FELIX and A. MAGER (Z. physiol. Chem., 1937, **249**, 126—134; cf. A., 1936, 1544).—At p_H 4·3 the Me ester hydrochloride of clupein (I) mixed with aq. insulin (II) yields a Cl-free salt containing equimol. amounts of (I) and (II) (S content 2·8%). 1 mg. of

the salt has the same activity as 12 international units of (II). The salt is inactivated by digestion with activated trypsin or pepsin + HCl. Similar salts are obtained from (I) and adenylic acid (III), hæmin (IV), hæm (V), protoporphyrin (VI), ascorbic acid (VII), and lactoflavinphosphoric acid (VIII). The mol. ratio of (I) to the other constituent in the salts with (III)—(VI) is 1 : 11 and in that with (VII) 1 : 10. The absorption spectra of the salts with the blood pigments [except (IV)] closely resemble those of the free pigments. The enzymic activity of the (VIII) salt is double that of free (VIII). The salts with the blood pigments are almost insol. and cannot be separated into their constituents without decomp. Their catalase activity is > that of the free pigments.

W. McC.

α- and β-caseinogen. K. KONDO and T. YAMADA (J. Agric. Chem. Soc. Japan, 1937, **13**, 791—804).—Fractional pptn. by EtOH of caseinogen (I) (goat's milk) dissolved in 40% urea solution yielded α- and β-(I) which correspond with the two fractions obtained by Gróh (A., 1934, 1119). α-(I) is insol. in 60—70% EtOH and has a high content of tyrosine, tryptophan, basic N, and P, whilst β-(I) is sol. in 60—70% EtOH and has a low content of the above constituents.

J. N. A.

Composition of tissue-proteins. II. Determination of arginine. S. GRAFF, E. MACULLA, and A. M. GRAFF. **III. Arginine in the placenta.** S. GRAFF and A. M. GRAFF. **IV. Determination of cystine.** S. GRAFF, E. MACULLA, and A. M. GRAFF (J. Biol. Chem., 1937, **121**, 71—77, 79—80, 81—86; cf. A., 1935, 1044).—The determination of small amounts (0·5—1·5 mg.) of arginine (I) in protein hydrolysates by means of its quant. conversion by arginase into ornithine and urea followed by determination of the urea by the xanthhydrol method is described.

III. The (I)-N val. expressed as % of the total N of human placentas (normal, premature, and diseased) was 14·4—15·3 and of guinea-pigs' placentas 14·7 to 15·1%. The (I) content of the human placenta-protein is therefore not unique and is consistent with the histology of the placenta.

IV. A micro-determination of cystine involves hydrolysis of the protein, reduction (Zn–HCl) of the cystine, filtration from humin and excess of Zn, pptn. as Cu mercaptide, and digestion by the Kjeldahl procedure or ignition for S determination.

P. W. C.

Optical properties of vertebrate nerve axons as related to fibre size. F. O. SCHMITT and R. S. BEAR (J. Cell. Comp. Physiol., 1937, **9**, 261—273).—The birefringence of the sheath of axons from frog sciatic nerve increases with increasing fibre diameter due to the progressive increase in amount of lipin dispersed with the protein in the sheath. A change from proteotropic to myelotropic character occurs at a diameter of about 2 μ., which corresponds with the size found by histological methods for the dividing line between non-myelinated and myelinated fibres.

M. A. B.

Optical properties of the axon sheaths of crustacean nerves. R. S. BEAR and F. O. SCHMITT (J. Cell. Comp. Physiol., 1937, **9**, 275—287).—The metatropic reversal of birefringence in crustacean axon sheaths produced by immersion in conc. solutions of various substances is due to the presence of a thin layer of oriented lipin material around the axis cylinder. Reduction of the positive birefringence of the oriented protein micelles in the sheath by increasing the n of the surrounding medium allows the negative intrinsic birefringence of the lipins to become evident. Preliminary treatment with lipin solvents prevents reversal by the usual agents.

M. A. B.

Birefringence of nerve sheaths as studied in cross-sections. P. CHINN and F. O. SCHMITT (J. Cell. Comp. Physiol., 1936, **9**, 289—296).—Birefringence of frog, cat, and lobster nerve axons, treated with EtOH to remove lipins from the sheath, shows that the micelles in the protein lamellæ of the sheath are oriented to some extent.

M. A. B.

Electrokinetic theory in the calculation of the charge on proteins.—See A., I, 615.

Colloid-chemical studies on meat proteins.—See B., 1937, 1263.

Phosphatides in healthy and diseased hearts. F. F. URBAN (Biochem. Z., 1937, **293**, 264—279).—Fresh healthy and diseased human hearts contain, on the average, 64 mg. of phosphatide-N per 100 g. Of this amount 29% is present as choline, 49% as NH_2-N, and 22% in some unknown state of combination. If the last fraction is left out of account the N : P ratio is 1·5 : 1. The hearts contain small amounts of creatinine and possibly traces of purine.

W. McC.

Phosphatides and cerebrosides. G. FAWAZ, H. LIEB, and M. K. ZACHERL (Biochem. Z., 1937, **293**, 121—132).—The phosphatides of human brain are completely extracted by treating with $CCl_3 \cdot CO_2H$, removing the sol. portion, and boiling the insol. residue for 6 min. with EtOH. About 80% of the total P of the EtOH extract is sol. in Et_2O and the N : P ratio for the Et_2O-sol. material is 2·04—2·56 : 1. Modification of the method permits the determination also of cerebroside in the same extract. The method is applicable to the determination of phosphatide in yeast.

P. W. C.

Lysolecithin and tosylglycerides. P. A. LEVENE and C. L. MEHLTRETTER (Enzymologia, 1937, **4**, Part II, 232—238).—The lysolecithin (I) prepared by the action of cobra venom on egg-yolk is derived mainly (>86%) from β-glycerophosphoric acid. Tri-*p*-toluenesulphonylglyceride with NaI gives *p*-$C_6H_4Me \cdot SO_3Na$ (II). *p*-$C_6H_4Me \cdot SO_2Cl$, glycerol α-Me ether, and C_5H_5N afford *di-p-toluenesulphonyl-α-methylglyceride* which with NaI gives (II). Oxidation of Ba α-glycerophosphate, αα′-distearylglyceride, or (I) gives AcCHO. Methylation products of (I) include Me stearate, palmitate, and glycerophosphate. The position of the fatty acid in α-(I) was not elucidated.

F. O. H.

Partial synthesis of muscle-adenylic acid.—See A., II, 481.

Constitution of adenosinetriphosphoric acid. II.—See A., II, 481.

Neurotoxins from venom of species of cobra. F. Micheel, H. Dietrich, and G. Bischoff (Z. physiol. Chem., 1937, **249**, 157—175; cf. A., 1936, 893).—Dil. solutions of the venom of *Naja flava* after subjecting to dialysis, ultrafiltration, and cataphoresis at 20—25° (3000—3500 v., $\not>$20 ma.) in a special apparatus yield two neurotoxins of which the min. lethal doses for mice are (I) 0·001 and (II) 0·00003 mg. per g., respectively. (II) is unstable even in absence of air. The venom of *Naja tripudians* yields a neurotoxin similar to (II), the min. lethal dose being 0·00008 mg. per g., and a cryst. neurotoxin (III) containing inorg. matter (probably ZnO). The min. lethal dose of (III) is 0·006—0·009 mg. per g. The neurotoxins are inactivated by $Cu_2O + O_2$ in presence of glutathione or cysteine (IV) (which is probably converted into cystine), but not by Cu_2O alone or (IV) alone. Glycerol, glycine, and H_3BO_3 prevent the inactivation. HSO_3' inactivates the neurotoxins with liberation of SH groups.

W. McC.

Production of hypertensive substances during autolysis of the kidney. E. Dicker (Compt. rend. Soc. Biol., 1937, **126**, 88—89).—Aseptic autolysis *in situ*, caused by ligaturing the renal artery for 24 hr., produces substances with peripheral hypertensive action. H. G. R.

Photo-labile pigments of the chicken retina. G. Wald (Nature, 1937, **140**, 545—546).—Rhodopsin and the photo-labile pigment of the cones, hitherto unknown, have been extracted from chicken retinas. The cone pigment, now named iodopsin, is apparently violet in colour. L. S. T.

Ovoverdin, a pigment chemically related to visual purple. K. G. Stern and K. Salomon (Science, 1937, **86**, 310—311).—The green, H_2O-sol. pigment of the egg of the lobster (*Homarus americanus*) is a carotenoid-protein, and is named *ovoverdin* (I). Aq. solutions give absorption bands centring around 6400 and 4700 A. The isoelectric point is at p_H 6·7 approx.; mol. wt. $\sim 3 \times 10^5$. EtOH, $COMe_2$, $CHCl_3$, C_5H_5N, C_6H_6, and dioxan, but not light petroleum, rapidly liberate the orange-red carotenoid from the pigment and the protein is coagulated. (I) is stable at p_H 4 to 8. AcOH and alkali liberate the carotenoid. (I) is stable towards dil. but not conc. aq. NH_3. It is more stable than visual purple. Solutions or films of (I) prepared with gelatin bleach to a straw-yellow shade when exposed to diffuse daylight for 1—2 days at room temp. Lactoflavin accelerates the bleaching. Solutions of the carotenoid in org. solvents fade more rapidly, yielding colourless decomp. products which, unlike retinene, give a negative Carr–Price test for vitamin-*A*. When rapidly heated to 65—70° green solutions change to orange-red. The absorption spectrum of the red form shows increased extinction at 4800 A. and an almost complete disappearance of the (I) band at 6400 A. The green colour reappears on rapid cooling, provided that heating is not prolonged or the temp. allowed to reach 80°, when an orange-pink protein coagulum is formed. L. S. T.

Sedimentation constant of ovoverdin. R. W. G. Wyckoff (Science, 1937, **86**, 311—312).—Ovoverdin solutions prepared from lobster eggs by the method described above (cf. preceding abstract) contain a homogeneous protein with a sedimentation const. at 20° of $10{\cdot}3 \times 10^{-13}$ cm. per sec. per dyne.

L. S. T.

Visual adaptation and chemistry of the rods. G. Wald and A. Clark (J. Gen. Physiol., 1937, **21**, 93—105).—Measurements of dark and light adaptation in varying circumstances conform with predictions from a chemical cycle proposed to describe the rhodopsin system. E. M. W.

Absorption bands of oxycytochrome-*C*. E. Yakushiji (Acta Phytochim., 1937, **10**, 125—128).—The prep. of cytochrome-*C* (I) (from heart muscle of ox) and its absorption bands in various media are described. The absorption spectrum of (I) in H_2O gives bands at 700 and 625 mμ. The former closely resembles that of oxycytochrome-*C* (II) in 10% NaOH at 670—680 mμ., the difference being ascribed to difference of p_H, whilst the latter is a typical methæmoglobin band. Examination of these and bands obtained in various acid and alkaline solutions indicates that the absorption spectra of (II) is a hæmatin spectrum complicated by the basic character of (I). P. W. C.

Dialysis of milk. III. Salt equilibrium with special reference to calcium, magnesium, and phosphorus. L. H. Lampitt, J. H. Bushill, and D. F. Filmer (Biochem. J., 1937, **31**, 1861—1873; cf. A., 1934, 1125).—The normally unstable salt equilibrium of milk is stabilised in the prep. of milk powder, so that shaking does not alter the amounts of dialysable Mg, Ca, or P. The reactions produced by acidification of raw separated milk with lactic acid (I) are not reversible, and the results of dialysis of milks of differing acidity cannot be compared even after neutralisation to the same p_H. The concn. of dialysable Ca and inorg. P $\propto$ the titratable acidity of milk powder solution to which (I) has been added. Dialysable org. P is unaffected. P. G. M.

Variations in calcium and phosphorus contents of cow's milk during the lactation period. T. M. Olson (S. Dakota Agric. Exp. Sta. Ann. Rept., 1934, 30—31).—The Ca and P contents of milk are high at the beginning of lactation. The Ca content falls to a min. at 6—8 weeks and remains substantially const. throughout until drying-off, when vals. rise to 20—30% $>$ normal. The P content falls rapidly at first (6 weeks) and then more slowly until the end of the period. Ch. Abs. (*p*)

Total sulphur in human and cow's milk. L. Révol and R. Paccard (Compt. rend. Soc. Biol., 1937, **126**, 25—26).—The vals. for human and cow's milk are 82—202 and 270—440 mg. per litre, respectively. The variation in the S is $>$ that in the N content. H. G. R.

Iodine and bromine [in milk]. J. S. McHargue (Kentucky Agric. Exp. Sta. Ann. Rept. [1933], 1934, 44—45).—The normal I content of milk in Kentucky is 30 parts per billion. I-feeding increases this 13-fold. Ch. Abs. (*p*)

Analysis of proteins. IX. Content in amino-acids of the caseinogen and lactalbumin of

woman's milk. R. H. A. Plimmer and J. Lowndes (Biochem. J., 1937, **31**, 1751—1757).—Analytical data are given for woman's and cow's milk and the nutritive vals. of the two milks are compared. W. O. K.

Composition of milk from stock rats : apparatus for milking small laboratory animals. W. M. Cox, jun., and A. J. Mueller (J. Nutrition, 1937, **13**, 249—261).—Rat milk contains 2—3 times the total solid content of human or cow milk and by comparison with these is low in carbohydrate and high in protein and fat. A. G. P.

Lipin analysis of human thoracic duct lymph. R. Reiser (J. Biol. Chem., 1937, **120**, 625—634).—A method for the determination of the lipin distribution in lymph is described and the following vals. are obtained for the thoracic duct lymph of a patient on low-fat diet : phospholipin (I) 70—87, total cholesterol (II) 23—31, free (II) 5—12, neutral fat (III) 300—344 mg. per 100 g. ; I val. of (I) 84—95, that of (III) 69—74. The mean M of the fatty acids in (I) and (III) as indicated by the ratio of their reducing power to $K_2Cr_2O_7$ to their titration val. to alkali, is close to that of stearic and oleic acids. A. L.

Storage of bull sperm for artificial impregnation. B. Hatziolos (Z. Züchtung, 1937, **B**, **38**, 199—254).—Best conditions for keeping the sperm are examined. The f.p. of semen was 0·62°, the Cl content 0·6—0·9%, and the p_H 6·39—7·81. At 13—19° the sperm remained alive in spermatic fluid 69 hr., in isotonic saline 71·76, in Ringer's and Tyrode solutions, respectively, 68·88 and 48·72 hr., but much longer at lower temp. At temp. <0°, sperms soon die. Of 20 cows, impregnated with sperms kept alive at low temp., only two became pregnant. P. W. C.

Reducing power and sulphur derivatives in exudates. K. Apprich and F. F. Urban (Biochem. Z., 1937, **292**, 360—367).—The reducing power of exudates from human patients was equiv. to 2·5—5·5 mg. of Prussian-blue per 100 c.c. The val. is reduced by an average of 27% by CH_2O, indicating a SH content of 0·12 mg. per 100 c.c. These vals. and those of total and inorg. S could not be correlated with the type of disease. F. O. H.

Indian snake venoms. II. Cobra venom : its chemical constitution, protein fractions, and their physiological actions. S. N. Ganguly and M. T. Malkana. **III. Enzymes in cobra and daboia venom. IV. Mechanism of the coagulant action of daboia venom on blood.** S. N. Ganguly (Indian J. Med. Res., 1936, **24**, 281—286, 287—294, 525—529).—II. The venom contains C, H, O, N, S, and P. The dried material contains 87·56% of protein (I), and also lecithin (II) and cholesterol; the (I) fractions are : globulin 20·31, albumin 39·69, primary proteose 11·31, and secondary proteose (III) 16·81%. (II) is present in combination with (I) as well as in the free state. The activity of the venom is due to (III), hydrolysis of which to NH_2-acids by tryptic digestion destroys the toxic effect.

III. Both cobra and daboia venoms contain proteolytic enzymes capable of digesting gelatin, cryst. ovalbumin, casein, and fibrin, and a (II)-splitting enzyme, which is more powerful in cobra venom. Antivenenene (IV) does not affect these enzymes. Cobra venom contains also a rennin-like enzyme, the action of which is neutralised by (IV).

IV. The venom cannot replace Ca, convert prothrombin into thrombin, or fibrinogen into fibrin. Its coagulant action is due to liberation of thrombokinase from blood-platelets by cytolysis. R. N. C.

Migration of the toxic constituents of cobra (*Naja naja*) venom at various p_H in an electric field. B. N. Ghosh and S. S. De (Indian J. Med. Res., 1937, **24**, 1175—1182).—Cobra-neurotoxin (I) and -hæmolysin (II) pass through parchment and ultra-fine filters, but Cellophane is impermeable. (I) and (II) show no isoelectric points between p_H 2·2 and 10·0, and are hence apparently moderately strong bases. Cataphoretic experiments using intercepting membranes permit the removal of >2/3 of the proteins associated with (I) and (II), and also the partial separation of (I) from (II). R. N. C.

Amylolytic activity of extracts of the salivary glands of octopods. R. de Marco (Riv. Biol., 1937, **23**, 74—80).—Aq. extracts of the salivary glands of *Octopus macropus* and *O. vulgaris* hydrolyse starch with production of dextrins but not of glucose. F. O. H.

Enzymic action in the digestive canal. I. Human and horse saliva. II. Saliva of animals. T. Matsuoka (J. Agric. Chem. Soc. Japan, 1937, **13**, 865—871, 872—874).—I. Human saliva contains large amounts of amylase (I) the activity of which is 0·045 of that of commercial Kyokuho diastase, and varies only slightly from day to day. Sex and period of year have very little effect on the activity. Horse saliva contains only small amounts of (I).

II. Cattle, sheep, pig, and goat saliva contain only very small amounts of (I), whilst saliva of dogs, cats, rats, and guinea-pigs contain relatively large amounts. J. N. A.

Glyco-ursodeoxycholic acid from bear's bile. —See A., II, 500.

Gastric analysis in Indians : study of 100 cases. M. N. Rao (Indian J. Med. Res., 1937, **24**, 1145—1157).—Analytical figures are given for free HCl, total acid, and total Cl′; pepsin and blood-Cl′ are also determined in some cases. R. N. C.

Relation between the p_H of the contents of the intestinal tract and the deposition of calcium in bones of rats. B. Bisbey and S. Cover (Missouri Agric. Exp. Sta. Ann. Rept. [1933], Bull., 1934, No. 340, 59—60).—No relation was apparent between the p_H of the upper and lower intestinal tract and rachitic changes in the bones of rats. The antirachitic action of vitamin-*D* cannot be ascribed to its action in changing the p_H of intestinal contents. Ch. Abs. (*p*)

Intubation of the human small intestine. W. O. Abbott and T. G. Miller (J. Amer. Med. Assoc., 1936, **106**, 16—18).—A method of collecting unaltered intestinal secretion and of studying intestinal absorption is described. Ch. Abs. (*p*)

Progress in clinical urinology. C. Mitchell (Clin. Med., Surg., 1936, **43**, 19—23).—A review.

Qual. tests, especially for residues of medicines in urine, are considered. CH. ABS. (*p*)

Determination of organic acids in urine by Hehner's method. P. FLEURY and CARON-CLAEYSEN (J. Pharm. Chim., 1937, [viii], **26**, 241—255).—The procedure is described. J. D. L.

Chemical identification of ascorbic acid in urine. P. J. DRUMM, H. SCARBOROUGH, and C. P. STEWART (Biochem. J., 1937, **31**, 1874—1878).—Dehydroascorbic acid was isolated as its 2 : 4-dinitrophenylhydrazone (20 mg.) from normal urine (12 l.). Another hydrazone was also isolated but not identified. P. G. M.

Source of androgenic and œstrogenic substances of the urine. A. S. PARKES (Lancet, 1937, **233**, 902—903).—A discussion. L. S. T.

Indophenol-(2 : 6-dichlorophenolindophenol-) reducing properties of urine. R. N. CHOPRA and A. C. ROY (Indian J. Med. Res., 1936, **24**, 239—248).—The indophenol (I)-reducing power of the urine of normal individuals depends considerably on their diet; it is not increased on a ketogenic diet. The (I) titre varies with the nature and concn. of the acids used for titration; with 1% AcOH it is < with $CCl_3 \cdot CO_2H$. AcOH, $CCl_3 \cdot CO_2H$, and H_2SO_4 are not efficient preservatives for (I)-reducing substances in urine, but 5% $CCl_3 \cdot CO_2H$ is apparently better than the others. The (I)-reducing power of the urine of patients with epidemic dropsy and even of some normal subjects is low, although symptoms of scurvy are never present. The reducing power runs almost parallel with uric acid excretion. R. N. C.

Duality of the coproporphyrins in bovine congenital porphyrinuria. C. RIMINGTON and G. C. S. ROETS (Nature, 1937, **140**, 584—585).—A photomicrograph of coproporphyrin III, isolated from a case of this disease, shows that, as with the related uroporphyrins, compounds belonging to both isomeric types, series I and series III, occur in certain pathological conditions. L. S. T.

Franke's reaction. A. E. RAICES and C. V. SUÁREZ (Rev. med.-quir. patol. femenina, 1935, **6**, 513—518).—Urine is shaken with aq. methylene-blue. In the presence of bilirubin a green colour is produced. Urobilin may interfere. CH. ABS. (*p*)

Excretion of vitamin-*C* in sweat. R. E. BERNSTEIN (Nature, 1937, **140**, 684—685).—Vitamin-*C* excreted in the sweat of Bantu labourers working at 96—97° F. in the Witwatersrand Au mines amounts to 0·5—1·1 mg. per 100 c.c.or approx. 2 mg. per hr. Urinary excretion of -*C* remains unchanged. L. S. T.

Symptomatology and pathology of potassium and magnesium deficiencies in rats. G. A. SCHRADER, C. O. PRICKETT, and W. D. SALMON (J. Nutrition, 1937, **14**, 85—109). A. G. P.

Injurious effects of sodium chloride and their prevention. E. KEINING and G. HOPE (Arch. Dermatol. Syphilol., 1935, **32**, 739—745).—Daily administration of 20 g. of NaCl to allergic patients caused shock. Irritation is caused by $Na^{\cdot}$ rather than by Cl'. KCl, $CaCl_2$, $MgCl_2$, and $SrCl_2$ caused no irritation. Mixtures of these salts and NaCl in proportions occurring in sea-H_2O and in blood-serum were non-irritating and therapeutic. CH. ABS. (*p*)

Anæmia and agranulocytosis during sulphanilamide therapy. G. H. JENNINGS and G. SOUTHWELL-SANDER (Lancet, 1937, **233**, 898—901).—Blood counts show that $p\text{-}NH_2 \cdot C_6H_4 \cdot SO_2 \cdot NH_2$ (I) is a potential marrow poison. Erythropoiesis and leucopoiesis may be depressed by (I). L. S. T.

Biochemistry of the anæmias. IV. Mineral constituents of the blood and phenylhydrazine anæmia. V. Carbohydrates and hæmorrhagic and phenylhydrazine anæmias. G. STOLFI and A. LALLI (Boll. Soc. ital. Biol. sperim., 1937, **12**, 288, 289; cf. A., 1937, III, 378).—IV. The [Cl'] of whole blood (rabbit) increases, mainly in the plasma, the serum-Na, -K, and -Ca also being increased.

V. The anæmia, especially that due to hæmorrhage, is followed by hyperglycæmia and diminution of liver-glycogen. The effect on glycolysis is irregular, the tendency being for the disappearance of glucose in a given vol. of blood to decrease and that per erythrocyte to increase. F. O. H.

Nitrogen metabolism of abscesses in anæmic and non-anæmic dogs. Reserve stores of protein apparently involved. F. S. DAFT, F. S. ROBSCHEIT-ROBBINS, and G. H. WHIPPLE (J. Biol. Chem., 1937, **121**, 45—59).—Normal non-anæmic dogs in which sterile abscesses were produced by subcutaneous injection of turpentine show fever, leucocytosis, and an increase in urinary N above the level of the fasting dog. With dogs which have been anæmic for years, similar fever and leucocytosis are produced but no increase in urinary N. A dog which had been anæmic for a few weeks showed an intermediate reaction. The labile protein stores which may contribute to the building of hæmoglobin or plasma-protein are probably factors related to protein catabolism and excess urinary N observed. Creatine vals. suggest that a part of these labile protein stores is present in the muscles and it is highly probable that the liver is concerned. P. W. C.

Hæmoglobin regeneration in anæmic rats in relation to iron intake : bioassay technique for measuring available iron. M. C. SMITH and L. OTIS (J. Nutrition, 1937, **13**, 573—582).—Modifications of Elvehjem's method for determining available Fe in foodstuffs are described. Data thus obtained for numerous foodstuffs are recorded. A. G. P.

Influence of iron from red clay on pig development. F. V. GAAZ and M. G. LUBNIKOVA (Probl. Animal Husbandry U.S.S.R., 1935, No. 3, 43—54).—Red clay of high Fe content prevents anæmia in pigs having no access to pasture, and is more efficient in this respect than proprietary Fe preps. CH. ABS. (*p*)

Sulphur (colloidal) therapy in treatment of arthritis. S. C. WOLDENBERG (Med. Bull. Veterans Admin., 1935, **12**, 10—26).—Arthritic patients are deficient in S (finger-nail tests). Injection of colloidal S increased the cystine vals. CH. ABS. (*p*)

Lactoflavin in the treatment of canine blacktongue. W. H. Sebrell, D. J. Hunt, and R. H. Onstott (U.S. Publ. Health Repts., 1937, **52**, 235—239).—Five experimental dogs died in 1—30 days after having received a total dosage of 8—38 mg. of riboflavin. Riboflavin has no therapeutic val. in acute blacktongue and is distinct from the preventive factor. W. L. D.

Mechanism of pathological calcification. W. E. Burge, O. S. Orth, H. W. Neild, J. Ash, and R. Krouse (Arch. Path., 1935, **20**, 690—696).—A demarcation current in injured frog muscle (2—4 μa.) was observed, and was > that in injured branches of greenhouse plants. PO_4''' was also present in injured muscle. Treatment of injured areas with $CaCl_2$ or $BaCl_2$ eliminated the demarcation current [probably by pptn. of $(CaBa)_3(PO_4)_2$]; dil. H_3PO_4 or NaH_2PO_4 restored it. The electronegative character of injured or contracted muscle is attributed to the presence of PO_4''' probably produced by hydrolysis of creatinine phosphate or adenyl pyrophosphate. Ca salts may be concerned in the production of cortical cataract and K salts in that of nuclear cataract. Ch. Abs. (*p*)

Calcinosis universalis. E. G. Ramsdell (West J. Surg. Obstet. Gynecol., 1935, **43**, 624—635).—Ca deposits in the subcutaneous tissues began to be absorbed almost immediately after unilateral thyroidectomy and attempted parathyroidectomy. Ch. Abs. (*p*)

Photosensitivity of chick embryo cells growing in media containing certain carcinogenic substances. M. R. Lewis (Amer. J. Cancer, 1935, **25**, 305—309).—Chick-embryo cells in media containing carcinogenic hydrocarbons develop photosensitivity to electric light. Methylcholanthrene, 1 : 2 : 5 : 6-dibenzanthracene, and 1 : 2-benzpyrene (0·05—0·1%) do not interfere with mitosis or growth of the cultures until exposed to bright light. After 2—10 min. changes occur in cells and mitosis is inhibited, although the cells subsequently recover and proliferate. No recovery follows prolonged exposure. Ch. Abs. (*p*)

Effect of prolonged cyanide treatment on body and tumour growth. I. H. Perry (Amer. J. Cancer, 1935, **25**, 592—598).—Prolonged inhalation of HCN retarded body growth and inhibited growth of Jensen sarcoma in rats. Ch. Abs. (*p*)

Intermediate glycolysis of tumour cells. A. Caló (Acta Cancrologica, 1935, **1**, 437—457).—During glycolysis of tumour tissue in a glucose substrate PO_4''' disappears more slowly than during the glycolysis of muscle, and the rate of dissociation of esterified PO_4''' is also less. Neoplastic tissue hydrolyses hexose diphosphate, glycerophosphate, phosphoglyceric acid, and glyceraldehydephosphoric acid without production of lactic acid (I). AcCHO is converted into (I), MeCHO being the intermediate product. Ch. Abs. (*p*)

Disturbance of lipin metabolism in patients with malignant tumour. II. R. Indovina and S. Fiandaca (Acta Cancrologica, 1935, **1**, 605—616).—Unsaturated lipins extracted from dried serum by Et_2O represent weakly bound or available forms. Total unsaturated lipins are determined by boiling dried serum with Et_2O–EtOH (1 : 3). The ratio of the two vals. ("availability quotient") is 6 normally and in cases of liver and kidney diseases, and 2 in cancer. Ch. Abs. (*p*)

Sensitisation of the skin of mice to light by carcinogenic agents. I. Doniach and J. C. Mottram (Nature, 1937, **140**, 588).—White mice painted with benzpyrene (I) in C_6H_6 become sensitised to light. Only blue-violet light, corresponding with the absorption spectrum of (I), is effective. Tar and dibenzanthracene produce similar reactions. L. S. T.

Pulmonary tumours in mice. I. Susceptibility of lungs of albino mice to the carcinogenic action of 1 : 2 : 5 : 6-dibenzanthracene. H. B. Andervont (U.S. Publ. Health Repts., 1937, **52**, 212—221).—Mice of special strain were given subcutaneous injections of dibenzanthracene (0·8 mg.) in lard (0·2 ml.). Most of the animals developed lung tumours in a shorter time than subcutaneous tumours. W. L. D.

Derivatives of 1 : 2-benzpyrene.—See A., II, 491.

Reaction of tarred rabbits to the infectious fibroma virus (Shope). C. H. Andrewes, C. G. Ahlström, L. Foulds, and W. E. Gye (Lancet, 1937, **233**, 893—895).—Rabbits injected with tar and then with fibroma virus show a generalised fibromatosis not found in rabbits without tar, and the regression of intracutaneous fibromata is delayed. Benzpyrene affects the response of rabbits to intravenous or intradermal inoculations of fibroma virus in a manner similar to tar. L. S. T.

Fractionation of guinea-pig's liposarcoma. P. Mendeléeff (Compt. rend. Soc. Biol., 1937, **126**, 80—82).—The fraction obtained after treatment of the tumour juice with colloidal $Al(OH)_3$ and filtration with a Berkefeld filter D3 contains the sp. principle antigenic to rabbits and producing antibodies which arrest the growth of the cancerous tissues *in vivo* in guinea-pigs. H. G. R.

Effect of liposarcoma (Murrey) and organ extracts on germination and growth of wheat. L. Havas and P. Mendeléeff (Compt. rend. Soc. Biol., 1937, **126**, 83—85).—Extracts of sarcoma stimulate germination and slightly stimulate growth, whereas extracts of the organs of rabbits immunised against the sarcoma have no effect on germination and inhibit growth. H. G. R.

Occurrence of vitamin-B_2 in rat sarcoma: vitamin-B_2 content of liver tissue. L. B. Brabec (Amer. J. Cancer, 1935, **25**, 551—584).—Rat sarcoma tissue contained small quantities of vitamin-B_2. The amounts in the liver tissue of tumour-bearing rats was seven times that of sarcoma tissue but < that of normal liver tissue. -B_2-deficient diets do not prevent the irritation or growth of rat sarcoma 39. No evidence was obtained that tumour growth consumes -B_2. Ch. Abs. (*p*)

Susceptibility to dental caries in the rat. V. Influence of calcium, phosphorus, vitamin-*D*, and maize oil. T. Rosebury and M. Karshan

(Arch. Path., 1935, **20**, 697—707; cf. A., 1935, 383).—With a rice–dextrin–spinach diet, supplements producing a high-level of Ca were more effective than those giving a low-Ca level in producing caries in rats. In both cases grinding the rice to pass a 100-mesh sieve prevented the occurrence of caries. Addition of cod-liver oil or viosterol in maize oil diminished but did not completely prevent caries even when supplemented with Ca and P to give the normal ratio at normal or high levels. Ultra-violet irradiation sufficient to produce improvement in calcification equal to that given by 5% of cod-liver oil was less effective in preventing caries than was vitamin-*D*. Maize oil significantly diminished the incidence of caries. Differences in incidence of caries among rats receiving diets with approx. adequate calcifying properties were unrelated to blood-Ca or -P. The protective action of calcifying diets was not paralleled by the extent of their calcifying action. CH. ABS. (*p*)

Minimal threshold of dental fluorosis. H. T. DEAN (U.S. Publ. Health Repts., 1937, **52**, 1249—1264).—The degree of fluorosis is gauged from an approx. mottled enamel index, and vals. for different Southern United States cities are tabulated. The index ∝ mean annual F content of the H_2O supply, which ranged from 0·7 to 2·2 p.p.m. Amounts <1 p.p.m. are of no public health significance.

W. L. D.

Acid in blood as a source of diseases of the skin. J. E. GINSBERG (Arch. Dermatol. Syphilol., 1935, **32**, 464—465).—In cases of common dermatoses, there was no acidosis or alkalosis. CH. ABS. (*p*)

Effect of succinic acid on diabetic ketosis. D. M. DUNLOP and W. M. ARNOTT (Lancet, 1937, **233**, 738—740).—Three case reports indicate that succinic acid has no effect in preventing the onset of diabetic coma or in diminishing chronic diabetic ketonuria. L. S. T.

Pancreatic and pituitary diabetes in vagotomised dogs. A. O. ETCHEVERRY (Compt. rend. Soc. Biol., 1937, **126**, 159—160).—Pituitary or pancreatic diabetes is not affected by vagotomy.

H. G. R.

Glycæmic curve after intramuscular injection of insulin in diabetics. A. FERANNINI (Minerva med., 1935, II, 674—677).—Data for 10 cases are recorded. CH. ABS. (*p*)

Eczema. I. Specificity of the eczematous skin reaction. G. MIESCHER. **II. Rôle of alkali in the pathogenesis of industrial eczemas. III. Rôle of alkali damage of the skin in experimental sensitisation to nickel.** W. BURCKHARDT. **IV. Action of bacterial toxins on the skin.** P. ROBERT (Arch. Dermatol. Syphilis, 1935, **173**, 119—154).—I. Skin reactions to panthesin, $Ca(OH)_2$, *d*-α-pinene, mustard oil, croton oil, HCl, cantharidin anhydride, and broth filtrates of bacteria and fungi are examined.

II. Patients exposed to alkaline liquors show increased toxic hypersensitivity to alkalis, the power of the epidermal cells to neutralise alkalis being retarded.

III. Patients from Ni-plating works show toxic hypersensitivity to alkali. A single application of $NiSO_4$ produces Ni-sensitisation in some alkali-sensitive persons. CH. ABS. (*p*)

Blood-iodine in relation to thyroid disease. Basic concept of the relation of iodine to the thyroid gland: an iodine-tolerance test. H. J. PERKIN, F. H. LAHEY, and R. CATTELL (New England J. Med., 1936, **214**, 45—52).—Blood-I vals. in adenomatous goitre, in primary hyperthyroidism, and during curative treatment are recorded. In I-tolerance tests, blood-I is determined 0·5, 1·0, 1·5, and 2·5 hr. after administration of I in milk.

CH. ABS. (*p*)

Blood-p_H and -lactic acid in different types of heart disease. I. HARRIS, E. W. JONES, and C. N. ALDRED (Quart. J. Med., 1935, **4**, 407—415).—Under resting conditions blood-lactic acid (I) increases in heart failure, although -p_H is normal except in extreme cases. Amounts of (I) produced by exercise increase with the extent of heart failure.

CH. ABS. (*p*)

Œstrogenic substances in treatment of pelvic inflammatory disease. C. F. FLUHMANN and P. E. HOFFMANN (West. J. Surg. Obstet. Gynecol., 1935, **43**, 678—680).—Successful use of amniotin is recorded. CH. ABS. (*p*)

Physiology of the impaired liver. J. L. BOLLMAN and F. C. MANN (Ergebn. Physiol., 1936, **38**, 445—492).—Extensive injury to the liver or removal of large parts (up to 80%) of it frequently has but little effect on functions such as excretion of bile, regulation of blood-sugar, urea production, and deamination of NH_2-acids but after complete removal production of glucose, bile salts (I), and allantoin ceases and NH_3, uric acid, or (I) if administered is not altered or destroyed. W. McC.

Mastitis. Effect on milk and tests for its detection. K. G. WECKEL (Nat. Butter and Cheese J., 1937, **28**, No. 12, 10—17).—Subclinical mastitis affects the yield and the properties of milk in the manufacture of products, especially cheese since curd strength is decreased and renneting time is increased. The importance of frequent testing of the four quarters of the udder by > one test is stressed. Changes in milk due to mastitis are tabulated and field tests are described. The most reliable are the bromthymol-blue and the catalase tests.

W. L. D.

Urinary proteins: appearance of kidney protein in urine of cases of chronic glomerular nephritis. G. GILMAN (J. Urol., 1935, **34**, 727—731).—In preuræmic stages of nephritis urine may contain an antigenic substance probably derived from the kidneys. Fractionation [$(NH_4)_2SO_4$] of a protein from urine of a patient in the last stages of chronic nephritis is described. Antisera obtained by injection of the two fractions were treated with the min. amounts of human serum-protein required to absorb the sp. precipitins. Resulting sera gave positive reactions with the original antigens and with a protein derived from a kidney autolysate. Proteins from other organs gave negative reactions. CH. ABS. (*p*)

Elimination of phosphate and renal phosphatase activity following unilateral nephrectomy. P. GILIBERTI (Boll. Soc. ital. Biol. sperim., 1937, **12**, 358—361).—Unilateral nephrectomy in rabbits is followed by diminution in urinary inorg. P lasting 4—5 days; during and after this period, the phosphatase activity of the renal parenchyma is practically unchanged. F. O. H.

Ratio dehydroascorbic : ascorbic acid [in urine]. B. BRUNO and M. GIUSEPPE (Boll. Soc. ital. Biol. sperim., 1937, **12**, 307—309).—In normal men, the ratio is 0·08—0·70 (average 0·338), the corresponding vals. for patients with renal–gastric–hepatic or Addison's disease being 0·63—3·80 (1·806) and 7·00—8·50 (7·70), respectively. F. O. H.

Sugar tolerance in obese subjects. Review of 65 cases. R. F. OGILVIE (Quart. J. Med., 1935, **4**, 345—348).—Sugar tolerance diminishes with duration of obesity and with advancing age. There is hypertrophy of the islets of Langerhans. Lack of ovarian secretion may decrease sugar tolerance. CH. ABS. (*p*)

Effect of surgical operation on (A) urinary excretion of sulphur. G. AGOSTA. (B) Blood-glutathione. G. AGOSTA and L. BILOTTI (Boll. Soc. ital. Biol. sperim., 1937, **12**, 282—283, 283—284).—(A) Acid S is significantly, and total S slightly, diminished whilst ethereal and neutral S are increased. The increase in neutral S ∝ the degree of operative trauma.

(B) The erythrocyte count may either increase or diminish, the blood-glutathione following a parallel course. F. O. H.

Wool of sheep with osteomalacia. R. SALGUES (Compt. rend., 1937, **205**, 580—582).—The yield of wool from merinos with osteomalacia is 56·4% < normal. The H_2O and fatty acid content and the Ca : P ratio are increased, whilst the ash and protein contents are decreased. J. L. D.

Blood-sugar and glycæmic curve during Parkinson's disease. G. OGGIONI (Boll. Soc. ital. Biol. sperim., 1937, **12**, 330—333).—The described characteristics of the blood-sugar curve due to ingestion of 1 g. of sucrose per kg. body-wt. are modified by effective curative treatment. F. O. H.

Rôle of manganese and certain other trace elements in the prevention of perosis. H. S. WILGUS, jun., L. C. NORRIS, and G. F. HEUSER (J. Nutrition, 1937, **14**, 155—167).—Mn (and to a smaller extent Zn and Al) prevents perosis in chicks. A mixture of Mn, Al, and Fe is entirely preventive in presence of limited amounts of Ca and P. A. G. P.

Fitness, sulphanilamide, and pneumococcus infection in the rabbit. A. LOCKE, R. B. LOCKE, R. J. BRAGDON, and R. R. MELLON (Science, 1937, **86**, 228—229).—Data showing the effectiveness of sulphanilamide in experimental pneumococcus infection as determined by the condition of the rabbit and the capacity for resistance are recorded. L. S. T.

Permeability of blood–central nervous system barrier in experimental poliomyelitis as determined by the nitrate test. E. H. LENNETTE and H. R. REAMES (Proc. Soc. Exp. Biol. Med., 1937, **36**, 769—770).—A slight increase in the barrier to NO_3' occurs in experimental poliomyelitis. H. G. R.

Permeability of the blood–central nervous system barrier to sodium bromide in experimental poliomyelitis. E. H. LENNETTE and D. H. CAMPBELL (Science, 1937, **86**, 160).—The data recorded show that NaBr passes into the spinal fluid more readily in poliomyelitic than in normal monkeys. An increase in blood–central nervous system barrier is thus indicated in experimental poliomyelitis. L. S. T.

Lipin metabolism and psoriasis. Determination of individual lipin fractions in fasting and fat-charged serum of psoriatic and non-psoriatic persons. F. SCHAAF and M. OBTULOWICZ (Arch. Dermatol. Syphilis, 1935, **173**, 253—261).—No differences were found in the total fatty acid, phosphatide-P, or cholesterol (free or esterified) contents of sera from psoriatic and non-psoriatic patients with or without liver impairment. Variations in lipin fractions after eating were considerable among healthy individuals. CH. ABS. (*p*)

Clinical spectroscopy. Retention of nickel in psoriasis. L. E. GAUL and A. H. STAUD (Arch. Dermatol. Syphilol., 1934, **30**, 697—703).—The Ni content of psoriatic was > that of normal persons. Literature on sources of Ni in food is reviewed. CH. ABS. (*p*)

Coal tar and allied substances. M. E. OBERMAYER and S. W. BECKER (Arch. Dermatol. Syphilol., 1935, **31**, 796—810).—Effects of applying coal tar fractions and a no. of phenols to psoriatics are recorded. Pyrocatechol and 8-hydroxyquinoline were the most effective but were inferior to the crude tar. Neither sulphonated bituminous tars nor petroleum tars showed therapeutic effects resembling those of coal tar. CH. ABS. (*p*)

Nutritive state in metabolism of women during pregnancy. F. C. HUMMEL, H. A. HUNSCHER, M. F. BATES, P. BONNER, I. G. MACY, and J. A. JOHNSTON (J. Nutrition, 1937, **13**, 263—278).—The daily storage of N, P, Cl, S, Ca, Mg, Na, and K during the last 65 days of gestation is recorded. The dietary requirements for pregnancy, especially N and Ca, are notably influenced by the previous nutritional history. A. G. P.

Chemical diagnosis of pregnancy by detection of œstrin in urine. M. J. SCHMULOVITZ and H. B. WYLIE (J. Lab. Clin. Med., 1935, **21**, 210—216).—Œstrin is determined by extraction with Et_2O under appropriate conditions and coupling with diazotised p-$NO_2{\cdot}C_6H_4{\cdot}NH_2$. CH. ABS. (*p*)

Histamine ionisation therapy. D. POTTER (J. State Med., 1935, **43**, 729—737).—Histamine ionisation produces a greater local effect in a short time without material skin injury than any ion used with an electric current. Effects are described. CH. ABS. (*p*)

Rickets in sheep. E. S. SIMPSON (Elder's Weekly, 1937, 764).—The livers of lambs suffering

from enzootic ataxia (Gingin disease) contain only about 0·001% of Cu (determined spectroscopically) as compared with 0·03% to 0·05% in normal animals. The deficiency of Cu in the pasture is the cause of the disease, which may be eliminated by the use of Cu-containing licks and dressings. W. O. K.

Rickets-producing action of cereals. M. DE BRUIN and J. BOUMAN (Z. Vitaminforsch., 1937, **6**, 295—309).—The greater rachitogenic activity in rats of oats than that of rice is not due to differences in org. P content nor to the Mg or low NaCl content of the oats. The activity of oats or rice is not affected by NaCl or Et_2O- or EtOH-extracts of the cereals but addition of EtOH-extract of barley reduces the activity of oats. The active principle of oats is present in aq. extracts, pptn. of which by EtOH yields an inactive ppt. and a filtrate containing material which promotes production of rickets when added to a rice diet. F. O. H.

Factors determining rickets in rats fed on cereal diets. J. C. MOTTRAM and N. PALMER (Cereal Chem., 1937, **14**, 682—686).—Rats fed on a purely cereal diet, as such or with excess of Ca salts, or on oatmeal in which all the P had been rendered digestible, developed rickets. Addition of Ca in amount equiv. to twice the P present prevented rickets. Potato starch, gluten flour, and caseinogen behaved similarly to the cereals. Hence the rachitogenic action of cereals is due not to a sp. factor but to an excess of P over Ca. E. A. F.

Effect of acid–base content of diet on the production and cure of rickets with special reference to citrates. A. T. SHOHL (J. Nutrition, 1937, **14**, 69—83).—For each Ca/P ratio in the diet there is a zone of low abs. amounts which produces rickets. Addition of NH_4Cl–$(NH_4)_2CO_3$ to non-rachitogenic diets renders them rachitogenic; addition to rachitogenic diets increases the severity of their action. NH_4Cl is the more active constituent. Addition of citric acid–Na citrate to rachitogenic diets, with all Ca/P ratios examined, eliminates the property of inducing rickets. The acid reaction and the alkali ash factors are both essential for this effect. Among org. acids examined only citric and tartaric acids were active in this respect. A. G. P.

Brain metabolism during the hypoglycæmic treatment of schizophrenia. H. E. HIMWICH, K. M. BOWMAN, J. WORTIS, and J. F. FAZEKAS (Science, 1937, **86**, 271—272).—O_2 utilisation by the brain, and hence its metabolic rate, is decreased during severe hypoglycæmia. Insulin, by decreasing blood-sugar, starves the brain, finally leading to hypoglycæmic coma. L. S. T.

Fall of vitamin-*C* content during acute experimental scurvy in the guinea-pig. E. NĚSPOR (Arch. Internat. Physiol., 1937, **45**, 128—134).—On a diet lacking vitamin-*C*, all organs show a more or less rapid depletion of -*C* during the first 14 days, after which symptoms become obvious. Subsequently depletion continues more slowly. The actual rates of depletion are characteristic for each organ. Spleen loses -*C* most rapidly ∝ its initial content, and is the earliest to become quite exhausted. The testis and brain still contain -*C* at the 28th day, which is the limit of survival. R. M. M. O.

Photometric determination of urea, uric acid, creatinine, and hæmoglobin in blood of scorbutic guinea-pigs. S. P. VILTNER and R. JOHNSTIN (J. Nutrition, 1937, **13**, 329—338).—Experimental technique is described. The decreased uric acid (I) in urine of scorbutic guinea-pigs is probably not related to increased blood-(I). In scorbutic animals hæmoglobin diminished but the subsequent anæmia was never severe. A. G. P.

Ten cases of idiopathic steatorrhœa. T. E. H. THAYSEN (Quart. J. Med., 1935, **4**, 359—395).—In cases described derangement of metabolism was characterised by increased fæcal fat, slightly increased N excretion, a flat blood-sugar curve, and increased basal metabolism. Fæcal fermentation frequently observed depended on fæcal acidity and was not due to starch. Carbohydrate digestion was normal. CH. ABS. (*p*)

Resorption conditions for bismuth: value in oral therapy for syphilis. S. SEREFIS (Arch. Dermatol. Syphilis, 1934, **171**, 1—98; cf. A., 1935, 657).—Curative effects of $BiCl_3$ on dogs are recorded; in alkaline solutions it was tolerated in large doses. Urinary elimination persisted 7 weeks after cessation of treatment. Glycerol (I) and citrates facilitated resorption by preventing pptn. of BiOCl in the stomach. Solutions of $BiCl_3$ in (I)–citrates are stable in dil. acids and alkalis but proteins ppt. Bi in 4 hr. Bi in urine may be determined by Barrenscheen and Frey's method, or if >0·02 mg. per 100 c.c. is present, by the colorimetric KI method, using a H_2SO_4 solution of the ash. CH. ABS. (*p*)

Mapharsen ("arsenoxide") in the therapy of experimental syphilis and trypanosomiasis. O. M. GRUHZIT, W. D. LINDSAY, G. HENDRICKS, and M. C. DODD (Arch. Dermatol. Syphilol., 1935, **32**, 848—867).—The therapeutic, sterilising, and curative indices of Mapharsen (*m*-amino-*p*-hydroxyphenylarsine oxide) compared favourably with that of arsphenamine and neoarsphenamine for rats and rabbits. CH. ABS. (*p*)

Immunochemistry of tuberculosis. S. OSATO (Proc. Imp. Acad. Tokyo, 1937, **13**, 223—228).—Aq. NaCl extracts of excessively infected tissue have a favourable influence when injected into patients and experimental animals. The active component occurs in the $COMe_2$-sol. neutral fat and also in the lecithin–kephalin fraction of the EtOH–Et_2O extract of human tuberculous lung. R. M. M. O.

Chemical detection of traces of metal in bullet wounds. A. BRÜNING and M. SCHNETKA (Chem.-Ztg., 1937, **61**, 827—830).—Material stained with powder smoke is treated with HNO_3 to dissolve metallic particles. The solution is tested for Pb by means of dithizone (I); for Cu by means of rubeanic acid (II) or Ritter's test for the catalytic action of Cu on the formation of a blue colour by the oxidation of *p*-$NMe_2 \cdot C_6H_4 \cdot NH_2$ + α-$C_{10}H_7 \cdot OH$ with H_2O_2; for Ni by spot tests (on paper) with (II) or dimethylglyoxime. Zn is tested for by means of (I); the interference due to the Cu, Pb, and Ni present is suppressed by adding

5% aq. Na_2S. 0·001 mg. of Zn then gives a red coloration in the presence of 0·1 mg. of Cu, Pb, or Ni. Sn salts alone interfere, but are eliminated by evaporating the solution with HNO_3. Smoke stains and contusion rings arising from shots with bare Pb bullets show much Pb, usually detectable by contact reaction without any need for dissolution in HNO_3. HNO_3 extracts from smoke stains from older small arms ammunition show traces of Pb, much Cu and Zn, and small amounts of Ni from Ni-plated cartridges. Modern (rust-free) cartridges give smoke stains with high Pb content. Blood does not interfere with the reaction for Pb. J. S. A.

Xanthoma. Biochemistry and pathogenesis. G. G. Villela and R. Junior (Mem. Inst. Oswaldo Cruz, 1935, **30**, 285—304).—Xanthoma without (but not with) renal injury caused cholesteroluria. In both cases the fatty acids and lipins of blood and tissues were increased. Insulin decreased cholesterolæmia in the first but not in the second case.
Ch. Abs. (*p*)

Life, a photochemical steady state. H. F. Blum (Science, 1937, **86**, 285).—A discussion. L. S. T.

Physiology of muscle. O. Riesser (Ergebn. Physiol., 1936, **38**, 133—250).—A review. W. McC.

Physiology and biochemistry of the reproductive organs. H. B. van Dyke (Ergebn. Physiol., 1936, **38**, 836—854).—An account is given of the H_2O, glycogen, phospholipin, free and esterified cholesterol, neutral fat, mineral, vitamin-*C*, enzyme, protein and other N contents of the reproductive organs of mammals (and of a few other species), of the physiological changes which occur in these (and in some other) contents, of the metabolism of the isolated uterus, isolated testis, and isolated seminal vesicle, and, in the case of some of the organs, of the effect of injection of sex hormones. Changes in the p_H of the vaginal fluid are also discussed. W. McC.

Basal metabolism of rats in relation to old age and exercise during old age. F. G. Benedict and H. C. Sherman [with H. L. Campbell and A. Zmachinsky] (J. Nutrition, 1937, **14**, 179—198).—The total basal metabolism per 24 hr. in old is > in middle age. Towards old age vals. approach a const. level of approx. 100 g.-cal. per kg. The actual basic heat output and the body-wt. decreased slightly with advancing age. Enforced vigorous exercise of middle-aged male rats not previously exercised caused loss of wt. and finally, death. Female rats so treated benefited from the exercise and showed diminished basal metabolism. A. G. P.

Energy metabolism of the hen. H. H. Dukes (J. Nutrition, 1937, **14**, 341—354).—In prolonged fasting the metabolic rate diminished for 75 hr. and then remained uniform. The R.Q. reached a steady level after 24 hr. Basal metabolism was lower in older hens. Basal heat loss due to vaporisation of H_2O averaged 17% of the total heat loss. Basal insensible loss and basal metabolism were positively correlated. Basal metabolism increased somewhat during egg production. A. G. P.

Heat production of small organisms. I. R. Taylor and F. Crescitelli (J. Cell. Comp. Physiol., 1937, **10**, 92—112).—The method described is based on the measurement of the heat, generated electrically, which must be added to one calorimeter in order to balance the heat produced by the organism in another differentially arranged calorimeter. The apparatus is largely automatic. The average error was ±3%. Results obtained on pupæ of various insects are given. M. A. B.

Measurement of heat production from insensible loss of weight. L. H. Newburgh, M. W. Johnston, F. H. Lashmet, and J. M. Sheldon (J. Nutrition, 1937, **13**, 203—221).—Calculation of heat production from the insensible loss of wt. (method described), the dietary carbohydrate, and urinary N yields vals. differing by <5% from those obtained by indirect calorimetry when several 24-hr. periods are averaged. A. G. P.

Derivation of factors for computing the gaseous exchange and heat production in the metabolism of proteins. M. Kriss and Le R. Voris (J. Nutrition, 1937, **14**, 215—221).—Data are obtained from observations of N, C, and energy balances of rats receiving a basal diet followed by one supplemented with heart muscle, casein, or gelatin. A. G. P.

Effect of galactose on human respiratory quotient and alveolar carbon dioxide. T. M. Carpenter (J. Nutrition, 1937, **13**, 583—600).—Ingestion of galactose (I) markedly diminished alveolar CO_2 and simultaneously increased the R.Q. With (I)–glucose mixtures the two effects were less closely synchronised. With lactose (II) the max. R.Q. was obtained considerably before the max. effect on alveolar CO_2, the lag being attributed to time required for hydrolysis of (II). The formation of acid products in the intermediate metabolism of (I) is indicated. Amounts of reducing substances (sugars) eliminated in urine following ingestion of various proportions of different sugars were in the ascending order, control, 50 g. of (II), 25 g. each of (I) and glucose, 25 g. of (I), 50 g. of (I). A. G. P.

Respiratory quotient following ingestion of glucose and of fructose as affected by the lactic acid and carbon dioxide changes in the blood. G. Bachmann and J. Haldi [with W. Wynn and C. Ensor] (J. Nutrition, 1937, **13**, 157—178).—Ingestion of 50 g. of glucose (I) produced in general no increase of blood-lactic acid (II) or decrease in $-CO_2$; ingestion of 50 g. of fructose (III) increased (II) and decreased $-CO_2$ within 15 min. The effect of 25 g. of (I) + 25 g. of (III) was similar. The metabolic R.Q. following feeding of (III) was > after (I). This is ascribed to conversion of (III) into fat. A. G. P.

Effect of exercise on metabolism following ingestion of water, glucose, and fructose as shown by the course of the respiratory quotient. J. Haldi and G. Bachmann [with W. Wynn and J. M. Little] (J. Nutrition, 1937, **14**, 287—304).—The increase in R.Q. during exercise was substantially the same when the sugar as when H_2O was ingested immediately before. Glucose (I) and fructose (II) produce the same results. Increased metabolism

caused by exercise persisted some few min. afterwards. In the sugar tests the R.Q. increased during the first recovery period above the level reached in exercise, mixtures of sugars producing the greatest and (I) the least effect.

Part of the glucose was probably converted into fat and exercise accelerated the conversion. Exercise accelerated the metabolism of (I) but not that of (II). A. G. P.

Relative oxygen consumption of dorsal and ventral regions of intact amphibian gastrulæ: observations on unfertilised eggs. J. Brachet and H. Shapiro (J. Cell. Comp. Physiol., 1937, **10**, 133—146).—O_2 consumption is 47% greater in the dorsal than in the ventral region of the embryo. No consistent difference was observed between the animal and vegetal poles of the unfertilised egg. M. A. B.

Relative respiratory activity of sheath and axones in resting *Limulus* optic nerve. H. Shapiro (J. Cell. Comp. Physiol., 1937, **9**, 381—396). —Respiration in the axones is $\gg$ in the sheath and varies in different portions of the axones, being highest in the middle. These relations are unaltered by variations of temp. M. A. B.

Respiration of the newt. I. The method and data on the normal and gonadectomised animal. C. M. Pomerat and M. X. Zarrow (J. Cell. Comp. Physiol., 1937, **9**, 397—415).—Respiratory rate was not affected by castration, but the R.Q. increased from 0·70 to 0·83. M. A. B.

Gaseous metabolism of working skeletal muscle. H. Brüner and F. Grosse-Brockhoff (Pflüger's Archiv, 1936, **238**, 361—373). M. A. B.

Respiration and gaseous metabolism in the initial stages of physical work. F. Grosse-Brockhoff, W. Schoedel, and W. Springorum (Pflüger's Archiv, 1936, **238**, 374—378). M. A. B.

Determination of respiratory quotient in marine animals. M. W. Bosworth, H. O'Brien, and W. R. Amberson (J. Cell. Comp. Physiol., 1936, **9**, 77—87).—Average R.Q. vals. are 0·89—1·05, indicating a mixed metabolism with that of carbohydrate preponderating. Similar vals. are given by air-breathing forms in a similar physiological condition; the metabolic processes are probably the same. Respiratory CO_2 reacts with the carbonates of crustacean chitin, producing extra HCO_3' and giving a false R.Q. The shells must therefore be covered with paraffin or collodion. M. A. B.

Oxygen consumption of tissues as a function of hydrogen-ion concentration of the media. C. Tarantino (Riv. Biol., 1937, **23**, 281—290).—Skin, kidney, and muscle tissue of rats in Ringer's solution have max. O_2 consumption at p_H 6·1, 6·7, and 6·7 respectively. The val. for skin is different (p_H 6·4—7·0) when the tissue is regenerating. Cancerous tissue of mice shows no max. val. with change of p_H. F. O. H.

Oxidative properties of isolated amphibian germinal vesicles. J. Brachet (Science, 1937, **86**, 225).—Tests on germinal vesicles isolated from *Rana fusca* indicate that the nuclear sap and the nucleoli reduce methylene-blue (I). Leuco-(I) is oxidised by the nucleoli. Respiration experiments indicate that the nucleus is not a centre of high metabolism in the growing oocyte. L. S. T.

Limnological investigations on respiration, annual migratory cycle, and related phenomena in fresh-water pulmonate snails. E. P. Cheatum (Trans. Amer. Microscop. Soc., 1934, **53**, 348—370)—The effects of $[O_2]$ in H_2O and of temp. on breathing rates and on O_2 consumption are examined. Ch. Abs. (*p*)

Determination of basal- and exercise-cardiac output in dogs. W. V. Cox, J. W. Hawkins, and H. F. Robertson (J. Lab. Clin. Med., 1935, **21**, 192—206).—A mask designed for measuring the O_2 intake is described. Ch. Abs. (*p*)

Cyclic consumption of oxygen during the first divisions of the eggs of frogs and toads. A. Stefanelli (Riv. Biol., 1937, **23**, 33—49).—The O_2 consumption, which is const. just before and after fecundation, cyclicly increases at the stages of blastulation and gastrulation to an extent dependent on the maturity of the egg at the time of fertilisation. The O_2 consumption of eggs of various species of *Bufo viridis* varies with their size. F. O. H.

Effect of pyocyanine on the metabolism of cerebral cortex. L. Young (J. Biol. Chem., 1937, **120**, 659—675).—The effect of pyocyanine (I) (2×10^{-3} to 4×10^{-5}M) on the metabolism of rabbit's cerebral cortex is studied. (I) accelerates respiration with glucose, fructose, lactate, or pyruvate substrates in O_2, this being followed by an irreversible inhibition of the respiration probably due to the α-OH on the phenazine nucleus in (I). In absence of substrate, no acceleration occurs. 0·001M-KCN has an inhibitory action. In concn. $>2 \times 10^{-4}$M, (I) increases aërobic glycolysis; at all concns. tested, anaërobic glycolysis is initially increased. A. L.

Respiration chamber for use with human subjects. L. H. Newburgh, M. W. Johnson, F. H. Wiley, J. M. Sheldon, and W. A. Murrill (J. Nutrition, 1937, **13**, 193—201).—The equipment and its operation are described. A. G. P.

Metabolism chamber which automatically maintains a constant partial pressure of oxygen. H. F. Pierce (J. Lab. Clin. Med., 1935, **21**, 317—322). —Apparatus is described. Ch. Abs. (*p*)

Specific dynamic action of food during rest and physical labour. I. Action of a carbohydrate breakfast. N. S. Savtschenko (J. Physiol. U.S.S.R., 1935, **19**, 1274—1280).—The max. sp. dynamic effect of carbohydrate breakfast occurs within 1 hr. of feeding, and in work is $<$ in rest. Ch. Abs (*p*)

Specific dynamic action of proteins in fasting animals. B. Cera and C. Lombroso (Boll. Soc. ital. Biol. sperim., 1937, **12**, 312—313).—Following prolonged fasting in dogs, a protein-rich meal produces no or very little sp. dynamic action. F. O. H.

Specific dynamic action of perfused blood. V. Martini (Boll. Soc. ital. Biol. sperim., 1937, **12**,

313—314).—Perfusion of surviving animals with blood (fresh or preserved at 0°) does not increase the metabolism. In animals on a protein-rich diet there is generally no change in gaseous metabolism; in some cases, however, the O_2 consumption increases by amounts approx. corresponding with the sp. dynamic action of an equiv. amount of protein orally administered. F. O. H.

Physiological bases of nutrition. S. J. Cowell (Brit. Med. J., 1937, 406—409).—A lecture. A. G. P.

Nutrition and metabolism of insects. C. H. Richardson (Iowa Agric. Exp. Sta. Rept. Agric. Res., 1934, 96).—The housefly distinguished between H_2O and sucrose (I) solution by touching the surface with the tarsi. Effects of various concns. of (I) are compared. At all concns. examined the response to fructose was < that to (I). Ch. Abs. (p)

Onychophora. II. Feeding, digestion, excretion, and food storage of *Peripatopsis*. S. M. Manton [with N. G. Heatley] (Phil. Trans., 1937, B, 227, 411—464).—The structure of the organs concerned with feeding and digestion of species of *Peripatopsis* is described. The digestive enzymes (see A., 1937, III, 220) are more suited to carnivorous than vegetarian habit. Fat, glycogen, and protein are stored in the intestinal wall and can maintain the animal during starvation for three months. Excretion occurs via the intestine, accumulatory organs, and nephridia. Urates are crystallised daily on the epithelial surface and are then collected and removed by the peritrophic membrane. The urine is acid and contains <7% of NH_3 (dry wt.). Slime ejection is a purely defensive action and is not employed in feeding. P. W. C.

Nutritional problems of domestic animals. W. Klein (Z. Züchtung, 1937, B, 35, 379—399).—Data for the growth and metabolism of a wether fed for 7 months on straw–molasses (N 1·2—1·3%) and starch are tabulated. Production of wool and wool-oil was normal. Metabolic data (especially for N) and the correlated activity of micro-organisms in the rumen and fæces are discussed. F. O. H.

Feeding of sheep. F. J. Warth and T. S. Krishnan (Indian J. Vet. Sci., 1935, 5, 216—231).—The digestibility of a hay–guinea grass–peanut cake ration varied with different animals and to some extent with their age. Wool yields varied with the nutritional condition of the animals. Ch. Abs. (p)

Influence of nutrition on the physiology of reproduction in sheep. A. E. Darlow and L. E. Hawkins (Oklahoma Agric. Exp. Sta. Rept. [1932—4], 1934, 100—106).—The breeding behaviour of ewes, previously well fed, was not affected by the nature of the ration during the breeding season. Occurrence of œstrus and success of mating of poorly nourished ewes were improved by feeding highly nutritional rations during the season. Ch. Abs. (p)

Maintenance metabolism of growing pigs. K. Breirem (Bied. Zentr. [Tierernähr.], 1936, A, 8, 463—498).—A relationship is established between maintenance metabolism and live wt. in pigs. For pigs weighing 40—50 kg. determinations of maintenance metabolism require a preliminary fasting period of 8—10 days. A. G. P.

Maize sugar similar in [nutrient] value to cane sugar. H. H. Mitchell and J. R. Beadles (Illinois Agric. Exp. Sta. 47th Ann. Rept. [1933—4], 1935, 78—80).—In digestion trials and carcase analyses with rats, no consistent differences in the val. of the two sugars were apparent. Ch. Abs. (p)

Physiological importance in nutrition of methods of preparation of foodstuffs. III. Content of histone bases in unroasted plant products. B. Bleyer, W. Diemair, and F. Fischler [with F. Arnold and H. Bickel] (Biochem. Z., 1937, 292, 301—311; cf. A., 1936, 1415).—Chemical and biological examination of aq. extracts of coffee, cereal products, etc. confirm the presence of preformed histone bases. Analytical data for the content in various fractions (*e.g.*, that pptd. by MeOH) are tabulated. F. O. H.

Nuts fail as adequate substitutes for meat. H. H. Mitchell and J. R. Beadles (Illinois Agric. Exp. Sta., 47th Ann. Rept. [1933—4], 1935, 80—82).—Beef-protein had a biological val. of 75, walnuts 56, raw peanuts 58, roasted peanuts 56, and pecan 75%. Analyses and results of (rat) feeding trials are recorded. Ch. Abs. (p)

Reproduction in rats receiving milk diets. H. J. Channon and K. M. Doran (Z. Vitaminforsch., 1937, 6, 309—316).—Rats fed on raw milk and biscuit of white flour containing (added) Cu, Mn, and Fe showed good growth and fertility through three generations. The results are contrasted with those of other workers using similar experimental methods. F. O. H.

Nutritional properties of meat. A. G. Hogan and W. S. Ritchie (Missouri Agric. Exp. Sta. Ann. Rept. [1933], Bull., 1934, No. 340, 27—28).—Six generations of rats grown on muscle meat or liver showed no ill effects. Wheat-germ oil as a source of vitamin-*E* did not improve the growth or reproduction of rats by comparison with controls. Ch. Abs. (p)

(A) **Individual variations in susceptibility to dietary deficiency.** A. L. Bloomfield. (B) **Latent deficiency in rats. Variations in weight loss on repeated feeding of defective diet.** L. R. French and A. L. Bloomfield (J. Nutrition, 1937, 14, 111—116, 117—129).—(A) Considerable differences are shown in the response of rats of the same age and breed.

(B) Rats which have lost wt. on a deficient diet and subsequently regained on an adequate diet show a more rapid loss of wt. when subsequently fed the deficient diet. The nature of this phenomenon is discussed. A. G. P.

Recovery in rats on refeeding after prolonged suppression of growth by dietary deficiency of protein. C. M. Jackson (Amer. J. Anat., 1936, 58, 179—194).—Female rats receiving a normal diet after 15 weeks of substantially protein-free feeding gradually regained normal size. Male rats similarly treated were small when mature. The reproductive capacity of the adult rats was normal. Ch. Abs. (p)

Protein supplements in poultry rations. VI. Influence of mungo in rations for chicks. C. N. Adan (Philippine Agric. J., 1935, **24**, 562—573).—Rations supplemented with shrimp meal produced more vigorous chicks than did those supplemented with mungo meal. The latter failed to promote normal sexual development and was inefficient in producing feathers. Ch. Abs. (*p*)

Food intake of young rats held at nearly constant body-weight by restriction of dietary protein. C. M. Jackson (J. Nutrition, 1937, **13**, 669—678).—Rats were maintained at const. body-wt. by feeding restricted amounts of protein (yeast–wheat germ) in conjunction with an otherwise adequate basal diet. After the initial period the daily consumption of protein diminished steadily for 6 weeks and subsequently remained const. The voluntary intake of the basal diet closely paralleled that of protein. The calorific val. of the whole diet consumed was slightly > that of the maintenance level. The maintenance protein requirement for male rats was somewhat < that of females. A. G. P.

Protein minima for nitrogen equilibrium with different proteins. D. Melnick and G. R. Cowgill (J. Nutrition, 1937, **13**, 401—424).—The min. amounts of lactalbumin, serum-protein, caseinogen, and gliadin essential to dogs for attaining N equilibrium were equiv. to 6·9, 8·6, 9·4, and 21·1% of the total ingested calories, respectively. The relative biological vals. were 100, 80, 73, and 33. A. G. P.

Comparison of heated casein with extracted casein in the basal diet for determination of vitamin-*A*. E. N. Todhunter (J. Nutrition, 1935, **13**, 469—476).—No appreciable difference was observed between the effects of EtOH-extracted and heat-treated casein when used as a protein source in a basal ration, on the growth, rate of depletion, or survival period of rats. A. G. P.

Toxicity of high-gliadin diets on the dog and rat. D. Melnick and G. R. Cowgill (J. Nutrition, 1937, **14**, 401—418).—Convulsive reactions of dogs were produced by diets in which gliadin (I) constituted ≮16% of the caloric intake. Delayed responses suggest the gradual accumulation and subsequent elimination of a toxic substance during feeding of (I). Increases in blood-non-protein-N were insufficient to account for convulsions. (I) toxicity may be due to a protein sensitisation, and is a species characteristic. Rats fed diets containing 18 and 36% of (I) were stunted to approx. the same extent. Supplementary feeding of lysine induced a greater response in those receiving the 36% (I) diet. A. G. P.

Effect of quality of protein on œstrous cycle. P. B. Pearson, E. B. Hart, and G. Bohstedt (J. Nutrition, 1937, **14**, 329—339).—Rats receiving a diet containing 5% of casein as principal protein source soon cease to exhibit the customary œstrous changes. Supplementary feeding of gelatin [high lysine (I)] induced partial œstrous response, but gliadin [low (I)] caused immediate resumption of normal sexual rhythm. Feeding protein-deficient diets does not cause permanent sterility. A. G. P.

Effect of diet on the constancy of urinary nitrogenous constituents excreted daily by pre-school children. J. E. Hawks, M. M. Bray, and M. Dye (J. Nutrition, 1937, **13**, 179—192).—Total urinary N, urea, creatinine, and (in one case) uric acid excreted by children receiving const. medium-protein diets varied to approx. the same degree as, and creatine to a greater extent than, the corresponding dietary vals. Transition to a high-protein diet increased the variability of total N, urea, NH_3, and creatine vals. for approx. 9 days, after which an equilibrium condition was reached. Acidity, uric acid, NH_2-acids, and creatinine contents showed no change in variability. Individual children tended to react similarly to alterations of dietary protein. A. G. P.

Growth on histidine and lysine administered by subcutaneous or intraperitoneal injection. R. M. Conrad and C. P. Berg (J. Nutrition, 1937, **14**, 35—43).—Injected histidine and lysine are effectively utilised by rats and effect growth increases comparable with those obtained by feeding the NH_2-acids. A. G. P.

Glycine contents of proteins of normal and chondrodystrophic chick embryos at different stages of development. A. R. Patton (J. Nutrition, 1937, **13**, 123—126).—Glycine (I) is synthesised during the development of chick embryos. Death due to chondrodystrophy during development is associated with < normal (I) contents of the proteins. A. G. P.

Nutritive value of commercial peptones. M. M. Castilla (Bol. farm. militar., 1935, **13**, No. 147, 65—67).—Determinations of nutrient vals. of peptones yield erroneous results if the material is adulterated with dextrin, which is pptd. with peptone in the Denayer test. A method of separating the dextrin is described. Ch. Abs. (*p*)

Biological synthesis of proteins. T. Baumgärtel (Chem.-Ztg., 1937, **61**, 885—886).—A brief review.

Excretion products of nitrogenous metabolism and their origin. I. End-products of the degradation of various amino-acids. G. Mourot (Bull. Soc. Chim. biol., 1937, **19**, 1209—1294).—A detailed account of work previously published (A., 1937, III, 259). P. W. C.

Muscular work and nitrogenous metabolism. M. D. Mezincesco (Arch. Internat. Physiol., 1937, **45**, 84—115).—An increase in the sp. endogenous N metabolism is obtained with muscular work, the ratio of the supplementary excretion of N to the energy liberated being similar to that of the endogenous excretion to the energy liberated at rest. This is due to an increased excretion of urea, a slight increase in uric acid, but little change in the creatinine val. H. G. R.

Digestion and absorption in the crab *Paratelphusa* (*Oziotelphusa*) *hydrodromus*, Herbst. A. R. Reddy (Proc. Indian Acad. Sci., 1937, **6**, B, 170—193).—Amylolytic, proteolytic, and lipolytic enzymes are present in the digestive secretion. The first has an optimum temp. of 45° and acts best in neutral solution. It hydrolyses starch, glycogen, and

sucrose. A cytase is also present. The proteolytic enzyme has optimum action in 0·05N-Na_2CO_3, whilst the lipolytic enzyme hydrolyses many fats and esters. Fats, glycogen, and Ca salts are present as reserves in the cells of the digestive glands. J. N. A.

Nutritive significance of the amino-acids and certain related compounds. W. C. Rose (Science, 1937, **86**, 298—300).—A review. L. S. T.

Lysine deficiency results in poor use of protein. J. Outhouse and R. Krouse (Illinois Agric. Exp. Sta. 47th Ann. Rept. [1933—34], 1935, 261—262).—Rats receiving a diet free from lysine (I) excrete more urea and creatinine and less allantoin than those receiving a similar diet containing (I). Lack of dietary (I) leads to increase in stature but not in growth, and probably to inefficient utilisation of protein and diminished cellular metabolism. Ch. Abs. (*p*)

Cystine deficiency in the albino rat. T. E. Weichselbaum (Quart J. Exp. Physiol., 1935, **25**, 363—367).—A large proportion of rats kept on a diet free from cystine (I) died. Feeding (I) or methionine (II) prevented this. After the appearance of deficiency symptoms (I) but not (II) showed curative action. Ch. Abs. (*p*)

Synthesis of *p*-bromophenylmercapturic acid in the fasting rabbit. W. J. Conway (J. Biol. Chem., 1937, **121**, 27—29).—Fasting rabbits, like cats and dogs (cf. A., 1936, 1406), are able to synthesise *p*-bromophenylmercapturic acid (I) from PhBr even after a fast of 32 days, the cysteine required being of endogenous origin. An improved method of isolating (I) is described. P. W. C.

Synthesis of phospholipins during absorption of fats. C. Artom and G. Sarzana (Arch. Internat. Physiol., 1937, **45**, 32—39).—Lipin-P of the liver, intestines, and kidney was shown to be radioactive 9 hr. after administration of olive oil together with PO_4''' containing a radioactive isotope of P (Fermi *et al.*, A., 1934, 1284); no change was observed in the muscle-, heart-, spleen-, or blood-lipins. H. G. R.

Phospholipin synthesis during fat absorption. C. Artom, C. Perrier, M. Santangelo, G. Sarzana, and E. Segrè (Boll. Soc. ital. Biol. sperim., 1937, **12**, 275—277; cf. A., 1937, III, 345). F. O. H.

Turnover of phospholipins in the intestinal mucosa. R. G. Sinclair and C. Smith (J. Biol. Chem., 1937, **121**, 361—372; cf. A., 1936, 1283).—In cats the change from a higher to a lower level of unsaturation of the phospholipins (I) of the mucosa following replacement of cod-liver oil by tallow in the diet occurs almost as readily as the reverse change which follows replacement of saturated by unsaturated fat in the diet. Administration of elaidic acid (II) results in replacement of 30—50% of the fatty acids of (I) by (II). The ratio of solid to liquid fatty acids in (I) is 36 : 65 but (II) replaces equal proportions of the solid and liquid acids. The % of solid acids in (I) is not decreased appreciably following absorption of large amounts of oleic or linoleic acid. Possibly in the enzymic synthesis of (I) selective absorption of saturated and unsaturated acids in the ratio 1 : 1 occurs, (II) being considered as both a saturated and an unsaturated acid. W. McC.

Effect of low-fat diets on serum-lipins of rats. A. E. Hansen and W. R. Brown (J. Nutrition, 1937, **13**, 351—357).—In rats receiving a fat-free diet serum-lipins (I) show a degree of unsaturation < normal. The I val. of (I) in young is < in old animals. Restriction of the intake of a normal diet to produce the same level of live-wt. as did the fat-free diet induced a degree of unsaturation of (I) which was > in normal animals receiving an unrestricted diet. Administration of Me linoleate sufficient to effect a clinical cure of the unsaturated fatty acid-deficiency disease caused a slight increase in the I val. of (I). Esters of oleic acid under similar conditions considerably increased the I val. of (I) even though effecting only a partial clinical cure. A. G. P.

Effect of choline on the lipin metabolism of blood and liver in the completely depancreatised dog maintained with insulin. A. Kaplan and I. L. Chaikoff (J. Biol. Chem., 1937, **120**, 647—657; cf. A., 1937, III, 345).—Choline (I) (0·25 g. per kg. per day) fed to depancreatised dogs maintained with insulin prevented the deposition of liver-fat, but the curative action of (I) on fatty livers once established was slow. The action of (I) is therefore similar to that of pancreas, but whether the latter is active only by reason of its (I) content is not known. (I) administration did not raise the blood-lipins above normal; the pancreatic blood-lipin factor therefore cannot be (I). A. L.

Dietary prevention of fatty livers. Two analogues of choline. H. J. Channon, A. P. Platt, and J. A. B. Smith (Biochem. J., 1937, **31**, 1736—1742).—Homocholine exerts a similar but more pronounced effect in controlling the % of fat in the livers of rats fed on diets which promote the development of "fat" or "cholesterol" fatty livers. $OH{\cdot}[CH_2]_2{\cdot}NPr_3{\cdot}OH$ has no effect on the development of fatty livers. P. G. M.

Nature of the lipotropic agent in pancreas. F. X. Aylward and L. E. Holt, jun. (J. Biol. Chem., 1937, **121**, 61—69).—A comparison of the lipotropic effect of choline and of pancreas (ox) in controlling the fatty liver produced by high-fat diets in rats indicates that the effect of the pancreas is adequately explained by its choline content. P. W. C.

(A) Reducing substances and (B) lipin degradation in sterile autolysates of the liver of depancreatised dogs treated with choline. G. Gallo and C. Ardy (Boll. Soc. ital. Biol. sperim., 1937, **12**, 315—316, 316—317).—(A) The autolysis is accompanied by an increase in the content of reducing substances (I).

(B) Variations occur in the fat content of the liver during autolysis. These are not related to the changes in (I). F. O. H.

Intestinal absorption of triolein in absence of bile or pancreatic juice. U. Lombroso, L. Bellini, and S. Filippon (Boll. Soc. ital. Biol. sperim., 1937, **12**, 311—312).—The rate of absorption of triolein in dogs with Vella fistulæ (A., 1937, III, 384)

equals that of oleic acid, both rates being increased by presence of pancreatic juice. F. O. H.

Flavin metabolism of newly-born children. W. Neuweiler (Z. Vitaminforsch., 1937, **6**, 316—324).—The flavin content of human milk is 16—52 $\times$ 10^{-6}%. Urinary excretion of lyochrome 9 days after birth is > that in adults and is increased by administration of lactoflavin (I). The effect of (I) intake on growth in a case of hypovitaminosis-B_2 is described. F. O. H.

Elimination of cinchonine and cinchonidine in the bile. F. Caujolle (Bull. Sci. Pharmacol., 1937, **39**, 425—428).—Cinchonine and cinchonidine administered intravenously to dogs are eliminated in the bile, the max. rate of elimination occurring 6 hr. after injection. W. O. K.

Biliary elimination of quinidine. F. Caujolle (Bull. Sci. Pharmacol., 1937, **44**, 376—379).—A small % of quinidine given intravenously to dogs is detected in the bile. E. M. W.

Degradation of diethylaniline and diethylaniline oxide in the animal body. F. Horn (Z. physiol. Chem., 1937, **249**, 82—84; cf. A., 1936, 1290).—In dogs and rabbits subcutaneously injected $NPhEt_2$ (I) is converted into p-$OH{\cdot}C_6H_4{\cdot}NEt_2$ (II) but not into $NPhEt_2{\cdot}O$ (III). No unchanged (I) is excreted in the urine. (III) is partly converted into (II) but chiefly excreted unchanged. (III) is very slightly toxic but (I) is more toxic than $NPhMe_2$. Methæmoglobin is observed in the blood of cats given lethal doses of (I) or (III). W. McC.

Metabolism of the higher hydroxy-acids. C. Artom, M. Gagliani, and E. Ventura (Boll. Soc. ital. Biol. sperim., 1937, **12**, 274—275).—The material, m.p. 118°, I val. 13·2, Ac val. 126·3, obtained by oxidation of oleic acid with alkaline $KMnO_4$, when administered to rats, is absorbed to the extent of 43—85% (*i.e.*, < that of stearic acid). Only traces are subsequently found in the organs and fat depots but the OH content increases in tissues and body-fats. No storage occurs in the liver. F. O. H.

Nutritional and metabolic significance of certain organic acids. A. H. Smith and J. M. Orten (J. Nutrition, 1937, **13**, 601—633).—A review. A. G. P.

Canned, home-cooked, and raw fruit diets. E. F. Kohman, W. H. Eddy, M. E. White, and N. H. Sanborn (J. Nutrition, 1937, **14**, 9—19).—No inherent advantage attaches to "rawness." Cooking need not cause deterioration of nutrient vals. but improves the texture of foods and inactivates detrimental enzymes. Canned foods afford an efficient source of Ca. A. G. P.

Acetylation. II. Effect of various substances on the production of p-aminobenzoic acid in rabbits. B. Harrow, A. Mazur, E. Borek, and C. P. Sherwin (Biochem. Z., 1937, **293**, 302—304; cf. A., 1933, 1194).—The acetylation of injected p-$NH_2{\cdot}C_6H_4{\cdot}CO_2H$ in rabbits is stimulated, in varying degrees, by injection of glucose, fructose, maltose, lactose, sucrose, AcOH, lactic acid, succinic acid, glycerol, oleic acid, glutamic acid, or glycine but not by that of NaCl or glutathione. Possibly carbohydrates, fats, and proteins undergo intermediate acetylation in the body. W. McC.

Conjugation of phenol in the eviscerated, nephrectomised dog. G. Barac (Compt. rend. Soc. Biol., 1937, **126**, 62—64).—The conjugation is demonstrated. H. G. R.

Activation of glycolysis by carotene. C. Aszkenazy, K. Stern, and R. Willheim (Biochem. Z., 1937, **293**, 30—38).—Aq. emulsions of lecithin (I) and cholesterol (II) do not materially affect the course of glycolysis of muscle extracts. The action of carotene (III) in increasing glycolysis is completely lost on adding (I) to the (III) emulsion whilst its action is maintained or even augmented when (II) is added. With mixtures of (I), (II), and (III), the effect is determined by the ratio of (I)/(II). P. W. C.

Glycolysis. I. Apomyozymase and the co-enzymes of glycolysis in muscle extract. L. P. Kendal and L. H. Stickland (Biochem. J., 1937, **31**, 1758—1773).—Highly, but not moderately, diluted dialysed rabbit's muscle extracts are activated to a greater extent by boiled muscle extract than by adenosine triphosphate (I) and $Mg^{\cdot\cdot}$. The glycolytic system contains a factor resembling, and possibly identical with, yeast cozymase, but there is also present a heat-stable factor apparently distinct from any of the known co-enzymes. By extraction of washed muscle pulp with Na_2HPO_4, the various components of the glycolytic system are partly separated, the order of extraction being (I) + $Mg^{\cdot\cdot}$, hexose diphosphate (II), cozymase, the new co-enzyme, and finally apomyozymase, a term used to denote a prep. of the glycolytic system, active in the presence of boiled extract, but the co-enzyme requirement of which is not satisfied by (I) + $Mg^{\cdot\cdot}$, (II), and cozymase. W. O. K.

Action of normal and diabetic sera on animal liver-glycogen *in vivo* and *in vitro*. O. L. V. de Wesselow and W. J. Griffiths (Lancet, 1937, **233**, 670—673).—Injection of fasting human serum reduces the liver-glycogen (I) of rats. Normal and diabetic sera produce the same % reduction. Human serum accelerates glycogenolysis in rabbit's liver pulp *in vitro*. No such effect occurs in the rat. The effects of injection of serum on the liver (I) of the rat are probably not due to amylolytic enzymes in the serum. L. S. T.

Refection in the rat. E. Kelly and H. T. Parsons (J. Nutrition, 1937, **13**, 453—468).—Raw potato starch in rat diets causes refection. Gelatinisation of the starch at temp. < that significantly affecting vitamin-B prevents refection. Elimination of -B by rats receiving a high-starch diet was approx. thrice that occurring when the starch was gelatinised. The non-extractable fat of the starch is not a significant factor in refection. A. G. P.

Influence of carbohydrate on nitrogen metabolism in the normal nutritional state. P. S. Larson and I. L. Chaikoff (J. Nutrition, 1937, **13**, 287—304).—A protein-sparing effect of additional dietary carbohydrate occurs only when the latter is administered within 4 hr. before or after the meal, *i.e.*, when an increase in protein metabolism is in

progress. The effect is most marked when the supplementary carbohydrate is given with or >1 hr. after the meal. The N thus spared begins to be eliminated several hours after its storage has occurred. Cessation of additional carbohydrate feeding is rapidly followed by increased N excretion. A. G. P.

Relation of ingested carbohydrate to type and amount of blood- and urine-sugar and to the incidence of cataract in rats. H. S. Mitchell, O. A. Merriam, and G. M. Cook (J. Nutrition, 1937, **13**, 501—511).—Blood-sugar vals. were higher on galactose- (I) than on lactose-containing rations but were > normal with all cataract-producing rations. When various sugars were supplied, resulting differences in total blood-sugar (II) were largely occasioned by differences in the non-fermentable fractions, the fermentable fractions remaining approx. const. and within the normal range of blood-glucose. In different strains of rats receiving a diet containing 35% of (I) the (II) vals. were similar but susceptibility to cataract differed considerably. Fructose–starch (III) rations caused neither hyperglycæmia nor eye changes. A xylose–(III) ration slightly increased (II) and caused transitory changes in the lens. Insulin–protamine did not lower blood-galactose or diminish the rate of development of cataract. Galactosuria occurred in all animals receiving (I) and lactose rations, being more severe with (I), but was absent from starch-fed controls. (I) is the major etiological factor in cataract. A. G. P.

Carbohydrate metabolism. II. Effect of a high-carbohydrate diet containing sugar on the glucose-tolerance curve in the albino rat. G. Sankaran and K. Rajagopal (Indian J. Med. Res., 1936—37, **24**, 1077—1081; cf. A., 1937, III, 291).—A high-carbohydrate diet containing sucrose does not affect the glucose-tolerance curve in rats, and the islets of Langerhans exhibit no degeneration. R. N. C.

Digestion of carbohydrates in mulberry leaves by silkworms. III. Growth and products of silkworms fed on mulberry leaves to which sucrose is added in different proportions. IV. Digestion of chemical components of mulberry leaves and composition of silkworms fed on leaves with added sucrose. K. Kato, S. Miwa, and S. Negi (J. Agric. Chem. Soc. Japan, 1937, **13**, 879—888, 889—897; cf. A., 1935, 523).—III. The body-wt. and health of silkworms, wt. of cocoon and raw silk, and sericin-N solubility of raw silk are increased by feeding on young leaves + 1 to 2% of sucrose (I). Excess of (I) causes a decrease. The ratio fibroin : sericin is increased by addition of (I). The denier of silk is only slightly affected but tends to decrease with older leaves + (I).

IV. The increase in digestion of dry matter ∝ amount of (I). The digestion of raw protein, fat, and ash is increased by addition of small amounts of (I), whilst an excess causes a decrease. 90% of the added (I) is digested. The H_2O content of the silkworm body is inversely ∝ (I), whilst the amount of fat and glycogen produced ∝ (I). The amounts of raw protein and finally silk are increased by small amounts of (I). J. N. A.

Physiological availability of heptoses. J. H. Roe and C. S. Hudson (J. Biol. Chem., 1937, **121**, 37—43).—Whilst *d*-mannoheptulose (I) is utilised by rabbits (A., 1936, 370) but not by rats, the *aldo*-isomeride, *d*-α-mannoheptose (II), is not utilised by either rabbits or rats. Both (I) and (II) are markedly laxative to rats, probably due to the fact that the absorption coeffs. are extremely low (0·012 and 0·010, respectively). P. W. C.

Comparison of glucose- and sucrose-tolerance tests. E. G. Schmidt, J. S. Eastland, and J. H. Burns (J. Lab. Clin. Med., 1935, **21**, 13—25).—Sucrose (I)-tolerance tests indicated abnormal carbohydrate metabolism as well as did those with glucose (II). In normal metabolism the (I)-tolerance test yielded blood-sugar curves within normal limits established by (II); no sugar appeared in urine. The blood-sugar response in diabetes and arthritis is recorded. Ch. Abs. (*p*)

Superiority of lactose over other carbohydrates [in nutrition of rats]. J. Outhouse and J. Smith (Illinois Agric. Exp. Sta., 47th Ann. Rept. [1933—4], 1935, 249—250).—Lactose (I) possesses approx. 75% of the calcifying effect of cod-liver oil in rats. Partial substitution of (I) for starch (II) in a vitamin-*D*-free rachitogenic diet improves calcification. Absorption and retention of Ca and P are similar for (II) and (I). Fæcal excretion of P from rats receiving (I) was < from those receiving sucrose or (II). Urinary P was highest on (I) diets and least on sucrose diets. Ch. Abs. (*p*)

Effect of (A) galactose, (B) glucose, and (C) fructose on the metabolism of alcohol in man. T. M. Carpenter and R. C. Lee (J. Pharm. Exp. Ther., 1937, **60**, 254—263, 264—285, 286—295).—(A) The R.Q. and fat metabolism rise after the ingestion of galactose (I) alone but fall after that of (I) + EtOH. EtOH decreases (I) tolerance.

(B) The R.Q. rises after ingestion of glucose (II) and falls after that of EtOH; EtOH + (II) cause a fall followed after 2 hr. by a rise. There is a greater fall in fat metabolism after EtOH + (II) than after (II) alone.

(C) Fructose gives results similar to those of glucose. E. M. W.

Glucose and hexose diphosphate breakdown in tumour tissue. B. E. Holmes (Biochem. J., 1937, **31**, 1730—1735).—Crocker mouse-tumour tissue forms lactic acid from both glucose (I) and Na hexose diphosphate (II). The tissue loses its glycolytic power on (II) by keeping at 0°. $AcCO_2H$ restores this but has no effect on (I)-glycolysis. *dl*-Glyceraldehyde inhibits (I)- but not (II)-glycolysis. P. G. M.

Intermediate metabolism of carbohydrates. H. A. Krebs (Lancet, 1937, **233**, 736—738).—Recent developments are summarised. L. S. T.

Deuterium as indicator in the study of intermediary metabolism. XI. Biological uptake of deuterium by fatty acids and cholesterol. D. Rittenberg and R. Schoenheimer (J. Biol. Chem., 1937, **121**, 235—253; cf. A., 1937, III, 422).—Palmitic acid and cholesterol (I) contain no H which

undergoes slow replacement by D when treated with D_2O in presence of acid or alkali at $< 100°$. When the D_2O content of the body-fluids of mice is maintained at 1·5% for > 98 days by injection of D_2O the D content of their fatty acids increases to a const. val., which is greater in saturated than in unsaturated acids. The time required for the D content of the fatty acids to reach half its max. val. is 5—9 days, that for (I) in mice being 15—25 days. The D content of (I) reaches 50% of that of the body-fluids. The (I) of chicken embryos which develop in eggs containing D_2O contains no D; (I) is not degraded or synthesised during the development of the eggs. In mammals (I) is probably produced from a large no. of small mols. W. McC.

Intermediary carbohydrate metabolism in embryonic life. VIII. Glyceraldehyde and glucolysis. J. Needham and H. Lehmann (Biochem. J., 1937, **31**, 1913—1925; cf. A., 1937, III, 346).—The inhibition of glycolysis by *dl*-glyceraldehyde (I) is due to the *l*-compound only; this does not reach 100% in the embryo owing to the formation of lactic acid (II) from (I) with glutathione as a co-enzyme. (I) is not an intermediate in glucose (III) breakdown and condensation to (III) does not occur in glyceraldehyde "fermentation." AcCHO is formed non-enzymically by shaking (I) at 37° and is transformed into (II) by glyoxalase. H. G. R.

Lactic acid in dogfish nerve. W. S. Root (J. Cell. Comp. Physiol., 1936, **9**, 137—147).—In the excised nerve lactic acid increases, both in N_2 and in O_2. In O_2–CO_2 mixtures the increase is smaller as the CO_2 tension rises. In O_2 or mixtures with low CO_2 tension, acid-binding power is decreased. M. A. B.

Chemical changes in smooth muscle. I. Chemistry of smooth muscle. E. Dworaczek and H. K. Barrenscheen. **II. Glycolysis in smooth muscle of hens' stomach.** W. Meeraus and G. Lorber (Biochem. Z., 1937, **292**, 388—396, 397—402).—I. Dephosphorylation in stomach muscle of hens and pigeons is extremely rapid. Autolysis for short periods significantly increases the total acid-sol. PO_4. The contents of creatinephosphoric acid, creatinine, and creatine and the traumatic formation of NH_3 are $<$ those of striped muscle; the NH_3 formed corresponds with the content of adenosinetriphosphoric acid (I), which in smooth muscle is readily decomposed to adenosinediphosphoric acid. (I) from striped muscle is identical with that from smooth muscle.

II. The course of glycolysis [degradation of glycogen to lactic acid, formation of hexose diphosphate and, from phosphoglyceric acid, $AcCO_2H$, and activation of the process of $AcCO_2H$ formation by adenylic acid and (I)] in smooth muscle is identical with that in striped muscle. F. O. H.

Intensity of succinate oxidation in surviving liver tissue. O. Rosenthal (Biochem. J., 1937, **31**, 1710—1718).—The rate of oxidation of succinate (I) by slices of liver from different rats is nearly the same and is relatively const. for 2 hr. Its intensity is approx. tenfold that of other respiration processes. In contrast to the oxidation of lactate and pyruvate, the oxidation of (I) is unaffected by starvation and is similar in this respect to the oxidation of glycerophosphate. P. G. M.

Circulation of phosphorus in the body revealed by application of radioactive phosphorus as indicator. L. A. Hahn, G. C. Hevesy, and E. C. Lundsgaard (Biochem. J., 1937, **31**, 1705—1709).—Radioactive P (as phosphate) was injected subcutaneously in rabbits. Within 27 days 45% was excreted in the urine and 11·5% in the fæces. A P atom spends approx. 30 days in the body. The ratio active P : normal P is highest in the kidney, liver, and muscle, and lowest in the bones. P. G. M.

Coupling of oxido-reductions and dismutations with esterification of phosphate in muscle. D. M. Needham and R. K. Pillai (Biochem. J., 1937, **31**, 1837—1851; cf. A., 1937, III, 346).—The synthesis of adenyl pyrophosphate (I) is intimately connected with oxido-reduction processes, and the balanced reaction may be formulated: 2 triose phosphate + cozymase (II) + adenylic acid (III) + $2H_3PO_4$ → 2 phosphoglyceric acid + reduced (II) + (I). The absence of (II) or presence of $CH_2I{\cdot}CO_2H$, which prevents oxido-reduction, will also prevent synthesis of (I). There is no evidence of the transfer of P in muscle extract from hexose diphosphate (IV) to (I). AsO_4''', which activates the breakdown of (IV), also prevents the synthesis of (I), although it has no effect on the oxido-reduction processes. P. G. M.

Absorption of inorganic and organic phosphorus from the intestine. M. Laskowski (Biochem. Z., 1937, **292**, 319—325).—The rate of absorption of Na_2HPO_4 in rats $\propto$ its concn., that from the upper part of the intestine being $>$ that from the lower. Na glycerophosphate is rapidly hydrolysed and the resulting inorg. PO_4''' readily absorbed. With Na phytin and diphosphoglycerate, slow hydrolysis results in a slow absorption rate of PO_4'''. The absorption of Na_2HPO_4 is unaffected by administration of calciferol and accelerated by that of parathyroid hormone. F. O. H.

Addition of acid sodium phosphate to table salt to correct phosphorus deficiency. Anon. (U.S. Publ. Health Repts., 1937, **52**, 1157).—A human adult requires 0·88 g. of P out of recommended 1·32 g. daily for maintenance. The daily P intake from 20 g. of NaCl mixed with 4% of NaH_2PO_4 would be 0·18 g. This would not be sufficient to correct P-deficiency. W. L. D.

Effects of deficiency of phosphorus on utilisation of food energy and protein. E. B. Forbes (J. Nutrition, 1937, **14**, 419—433).—Deficiency of dietary P sufficient to cause 15% decrease in body-P produced no effect on growth, or utilisation of protein or energy. With a diminution of 18% of body-P, protein digestibility decreased. A. G. P.

Effect of phosphorus and calcium on growth and breeding qualities of beef cattle. T. M. Clyburn and E. D. Kyzer (S. Carolina Agric. Exp. Sta. 47th Ann. Rept., 1934, 85—86).—Supplementary mineral feeding had no effect on the breeding quality of cattle. Ch. Abs. (*p*)

Immaturity of the organism as a factor determining the favourable influence of lactose on the utilisation of calcium and phosphorus. R. B. French and G. R. Cowgill (J. Nutrition, 1937, **14**, 383—399).—Lactose (II) favours the utilisation of Ca and P in young but not in mature dogs. Experiments with rats indicate that (I) diminishes the excretion of Ca into the intestine. A. G. P.

Calcium and phosphorus balances of Chinese college women. L. C. Kung and H. L. Yeh (Chinese J. Physiol., 1937, **12**, 139—146).—Using a Chinese diet adjusted to meet Ca and P requirements calc. according to Western standards, with average Ca and P intakes of 0·419 and 0·972 g. per day, respectively, 11% of the Ca and 2·4% of the P were retained. J. N. A.

Influence of parathyroid hormone, urea, sodium chloride, fat, and of intestinal activity on calcium balance. J. C. Aub, D. M. Tibbetts, and R. McLean (J. Nutrition, 1937, **13**, 635—655).—Intestinal absorption of Ca is not influenced by ingestion of urea or by over-secretion of the parathyroid. Ingestion of urea slightly increases blood-Ca in exophthalmic goitre and hyperparathyroidism and increases urinary excretion of Ca in all cases, independently of diuresis. In healthy conditions Ca excretion maintains a very steady level. A. G. P.

Influence of specific mineral deficiencies on growth of body and organs of the rat. E. S. Eppright and A. H. Smith (J. Nutrition, 1937, **14**, 21—33).—When the intake of food-calories is approx. half normal, Ca and P are the most effective minerals in maintaining body-wt. increases, size of thymus, and general nutritive well-being. Although Na and K, separately or together, do not promote growth in the absence of other nutritive elements they are necessary to support max. possible development on a given energy and protein allowance. With rations free from Ca but containing Na and/or K the ratio of heart- and liver-wts. to body-wt. increased. A. G. P.

Influence of some commonly used salt mixtures on growth and bone development in albino rats. L. B. Mendel, R. B. Hubbell, and A. J. Wakeman (J. Nutrition, 1937, **14**, 261—272).—Of four mixtures examined that of Osborne and Mendel gave highest bone-ash vals. If adequate Ca is supplied other constituents of mixtures may be given in amounts considerably < those usually employed. A. G. P.

New salt mixture for use in experimental diets. R. B. Hubbell, L. B. Mendel, and A. J. Wakeman (J. Nutrition, 1937, **14**, 273—285).—The mixture contains a higher % of Ca than those customarily employed, but produced adequate calcification of rat femurs with an average daily intake of Ca 50 and P 35 mg. A. G. P.

Variations in alkali reserve and its effect on liver function. Z. Gruzewska (J. Physiol. Path. Gen., 1935, **33**, 1093—1101).—In dogs with biliary fistulæ increased alkali reserve caused by artificial stimulation of gastric secretion, intravenous injection of $NaHCO_3$ (I), or injection through a digestive tube resulted in increased alkalinity of the bile. (I) was dispersed in the tissues and gradually released into the blood as elimination in the bile proceeded. Ch. Abs. (p)

Factors influencing mineral metabolism of dairy animals. H. W. Cave, W. H. Riddell, J. S. Hughes, C. H. Whitnah, and H. F. Lienhardt (Kansas Agric. Exp. Sta. Rept. [1932—4], 1934, 71—77).—Calves reared for 1 year on milk alone showed no anæmic symptoms, but the digestive tract was underdeveloped. P deficiency did not depress the digestive functions nor induce abnormal energy losses, but caused a higher energy metabolism. Addition of salts (Ca, Mg, P) to unsweetened evaporated milk in the proportion of 1 : 100,000 improved the quality of the canned milk. Ch. Abs. (p)

Excretion of mineral substances after administration of various salts and its relationship to inhibition of "serous inflammation" by vegetable diets. H. Kaunitz (Biochem. Z., 1937, **293**, 142—156).—The influence of administration of various salt solutions (110 c.c. of 2% NaCl or 110 c.c. of an equimol. solution of KCl, $NaHCO_3$, $KHCO_3$, NaH_2PO_4, or KH_2PO_4) on the excretion during the subsequent 5 hr. of H_2O, Na, K, Cl′, and PO_4''' by dogs having bladder fistulæ and fed on const. diet is investigated. After administration of NaCl, diuresis occurs but 85% of the H_2O and 75% of the Na and Cl are still retained after 5 hr. Both K and PO_4 excretion are increased. After KCl, a K-, Na-, and Cl-diuresis occurs and the inorg. PO_4 excretion is increased to the same extent as with NaCl. After $NaHCO_3$, elimination of H_2O is even < that with NaCl and retention of Na occurs; K excretion is unaltered and inorg. PO_4 excretion increased. With $KHCO_3$, diuresis is > that with KCl, the H_2O, Na, and Cl excretion being increased and PO_4 excretion unchanged. With NaH_2PO_4 only slight, but with KH_2PO_4 considerable, H_2O-, Na-, Cl-, and K-diuresis occurs. The action of vegetable diets on serous inflammation can be attributed only in part to the mineral content. P. W. C.

Potassium and chloride in *Thyone* muscle. H. B. Steinbach (J. Cell. Comp. Physiol., 1937, **9**, 429—435).—Cl′ diffuses freely in and out of the muscle fibres and sarcoplasm but not into the fibrils. The muscle fibre membrane is readily permeable to Cl′ (but not to K) in either direction. The [K] in the muscle is about 15 times that of the normal external medium and diffuses out only when the concn. in the medium is < normal (<0·01N). Above this concn. K diffuses into the muscle. K is normally conc. in the fibrils, which are saturated with it. M. A. B.

Cobalt as an essential element in animal nutrition. W. M. Neal and C. F. Ahmann (Science, 1937, **86**, 225—226).—A malnutrition (microcytic hypochromic anæmia), produced in calves fed on Co-free grass, hay, corn, and dried skim milk, is corr. by Co supplement and is aggravated by Fe^{III} NH_4 citrate and $CuSO_4$. L. S. T.

Absorption and excretion of iron. R. A. McCance and E. M. Widdowson (Lancet, 1937, **233**, 680—684).—A review. The capacity of the

bowel to excrete Fe and to control the amount excreted appears to have been greatly exaggerated. A new theory of Fe metabolism is advanced. L. S. T.

Absorption and excretion of iron before, during, and after a period of very high intake. E. M. Widdowson and R. A. McCance (Biochem. J., 1937, **31**, 2029—2034).—Two men and two women were placed on diets containing 7—9 mg. of Fe per day, attained an Fe balance, and then received by mouth about 1 g. of Fe daily. Positive balances were obtained in each case and, after discontinuing the Fe but allowing time for excretion of the unabsorbed Fe from the intestine, net absorptions of 1·5—5 g. of Fe occurred. The subjects were found to be again in Fe equilibrium on low Fe intakes. The body appears therefore to have little or no capacity for excreting Fe. In one woman, the hæmoglobin content rose from 84% (Haldane) to 101% during administration of the large doses but fell again afterwards to its original level. P. W. C.

Rôle of bromine in nutrition. P. S. Winnek and A. H. Smith (J. Biol. Chem., 1937, **121**, 345—352).—Rats on an adequate synthetic diet containing $<0·5$ p.p.m. of Br and others on the same diet supplemented with 16·5—20·2 p.p.m. of Br did not differ in food intake, rate of growth, or reproductive power, but ate less and did not grow as well as rats on a stock diet containing 16·5—20·2 p.p.m. of Br; the females failed to maintain their young. The young of the rats of the first group contained much less Br than did those of the third. The Br content of the rats of the second group was $\geqslant$ that of those of the third group, the Br : Cl ratio of the diet of the former being $\ll$ that of the diet of the latter. Br is probably not an essential constituent of the diet of the rat. W. McC.

Iron retention in infancy. G. Stearns and D. Stinger (J. Nutrition, 1937, **13**, 127—141).—Infants (7—54 weeks) receiving human milk showed a small positive Fe balance in all cases. With cow milk there was a daily loss of 0·05 mg. of Fe. Ability to retain Fe was unaffected by age. Fe retention was increased by feeding Fe-rich cereals or Fe NH_4 citrate but not by egg-yolk or spinach. No consistent relation was apparent between Fe retention and the intake of K, Ca, or P. An intake of 0·05 mg. per kg. was necessary to ensure any Fe retention and 0·1—0·15 mg. was needed to meet full requirements. A. G. P.

Conservation of blood-iron during the period of physiological hæmoglobin destruction in early infancy. G. Stearns and J. B. McKinley (J. Nutrition, 1937, **13**, 143—156).—Blood-Fe in infants reached min. at 4—6 weeks although excretion continued to exceed intake for a considerable period. A dietary source of Fe is necessary before 6 months o age. A. G. P.

Transference of ingested fluorine from parent to offspring. E. Reid and R. G. Cheng (Chinese J. Physiol., 1937, **12**, 233—237).—Progressive additions of F either as NaF or as tea infusion (cf. B., 1936, 811) to the diet of pregnant rats caused increasing amounts of F in the offspring as measured at weaning. Some of the maternal F was transmitted during fœtal life. J. N. A.

Improved growth of rats on iodine-deficient diets. R. R. Remington (J. Nutrition, 1937, **13**, 223—233).—Subnormal growth of rats receiving a goitrogenic diet (A., 1933, 1322) was improved by partial replacement of wheat-gluten by purified casein (I), dried pig liver, or dried brewer's yeast. (I) carries sufficient I to render it unsuitable for inclusion in goitrogenic diets. On a diet containing wheat-gluten 18, dried pig liver 2, yellow maize meal 78, $CaCO_3$ 1, NaCl 1% rats attain maturity and produce normal nos. of living young in spite of almost complete absence of I and colloid from the thyroid gland. A. G. P.

Proliferation-promoting substances from cells injured by ultra-violet radiation. G. S. Sperti, J. R. Loofbourow, and C. M. Dwyer (Nature, 1937, **140**, 643—644).—The production of these substances has been confirmed (cf. A., 1937, III, 216) by a new technique. Photomicrographs showing the effect on yeast (*S. cerevisiæ*) are reproduced, and the comparative effects of irradiated cells and Kreke's bios prep. are tabulated. L. S. T.

Birefringence of muscle and its variation during contraction. E. Bozler and C. L. Cottrell (J. Cell. Comp. Physiol., 1937, **10**, 165—182).—Variations in birefringence of muscle during contraction and stretching are explained on the basis of variations in the no. of oriented mols. M. A. B.

Effect of compression on viscosity of various organic liquids. U. Ebbecke [with R. Haubrich] (Pflüger's Archiv, 1936, **238**, 429—440).—The effect of pressure on η is negligible in protein solutions, slight in conc. solutions of sugars, moderately large in egg white, fish glue, starch, and honey, and very large in paraffin, olive, castor, cod-liver, groundnut, and peppermint oils. In the living cell the effect of pressure is, therefore, probably on the fat and lipin constituents and not on the protein or protoplasm. M. A. B.

Effect of galvanic current on the envelopes of cells. Fr. Scheminzky and Fr. Scheminzky (Biochem. Z., 1937, **293**, 256—263).—Currents of 400 v. (10—100 ma.) applied to the membrane of the unfertilised egg of the trout cause a structural change which precedes the pptn. of globulin. Since a layer of H_2O separates the membrane from the electrode the change occurs when the membrane forms the interface between two conducting media. The change, which is probably accompanied by increased permeability of the membrane, appears to consist of a decrease in the fat and lipin contents of the affected part of the membrane. W. McC.

Stimulation of the vagus nerves and secretion of insulin. A. O. Etcheverry (Compt. rend. Soc. Biol., 1937, **126**, 156—159).—In dogs with enervated liver, stimulation of the vagus is accompanied by a slight fall in blood-sugar. H. G. R.

Effect of enervation of the pancreas or the liver or of abdominal sympathectomy on sugar regulation in dogs. A. O. Etcheverry (Compt. rend. Soc. Biol., 1937, **126**, 149—151).—Enervation

of the pancreas is similar in effect to vagotomy, whereas no effect was observed in enervation of the adrenals or liver or in the abdominal sympathectomy. H. G. R.

Temperature and the growth of [human] hair. P. Eaton and M. W. Eaton (Science, 1937, **86**, 354).—Data are recorded. L. S. T.

Resistance of silkworm eggs to heat. K. Yamafugi and S. Goto (Bull. Agric. Chem. Soc. Japan, 1937, **13**, 79—80).—When heated in H_2O to 50°, the eggs lose their power of development much quicker than when heated alone. They are practically unchanged at 40°, whilst 60° causes death in 1 min. The action of HCl (*d* 1·075) at 40° is <, and at 50° >, that of H_2O at the same temp. Normal eggs and those produced under unfavourable conditions showed no difference in their resistance. J. N. A.

Effect of hydrogen-ion concentration on the induction of polarity in *Fucus* eggs. II. Effect of diffusion gradients brought about by eggs in capillary tubes. D. M. Whitaker and E. W. Lowrance (J. Gen. Physiol., 1937, **21**, 57—70; cf. A., 1937, III, 132).—An egg placed near one end of a close-fitting capillary tube in an initially homogeneous medium develops in a gradient of (*a*) its own diffusion products and (*b*) O_2 tension. When initial p_H is 6·5—7·6, a high % of the eggs develop rhigoid protuberances towards the far end of the tube. Near p_H 8·0 this % drops to 50 and at p_H 8·6 has fallen to <25. At p_H >9·0 salts ppt. from the sea-H_2O medium but the % appears to increase rather than decrease. The polarity of the egg is probably determined by (*a*) rather than (*b*). E. M. W.

Effect of lack of oxygen on cell permeability. F. R. Hunter (J. Cell. Comp. Physiol., 1936, **9**, 15—27).—Lack of O_2 had no effect on the permeability of ox erythrocytes or of fertilised or unfertilized *Arbacia* eggs to org. compounds. M. A. B.

Mechanism of adaptation of free ending factile receptors in frog skin. M. A. Rubin and B. J. Syrocki (J. Cell. Comp. Physiol., 1936, **9**, 29—35).—Pptn. of K in frog skin with MacCallum's cobaltinitrite reagent, followed by microscopical examination, shows that the K occurs almost entirely in the epithelium, with only traces in the deeper layers. Since adaptation is very rapid in free epidermal and very slow in sub-epidermal endings, the observations support Hoagland's hypothesis that adaptation is due to depression of excitability by K which diffuses out of the epithelial cells. M. A. B.

Rôle of tissue spaces in the osmotic equilibrium of frog muscles in hypotonic and hypertonic solutions. W. O. Fenn (J. Cell. Comp. Physiol., 1936, **9**, 93—103).—The muscle did not behave as a simple osmometer; about 15% of the fibre-H_2O was osmotically inactive. Chloride spaces were larger in hypertonic than in normal or hypotonic Ringer's solution, but in all cases tended to increase as more fibres became permeable to Cl′. In aq. NaCl or sucrose wt. changes were due entirely to increases in chloride space. In stretched muscle wt. decreased at the expense of the chloride space. Frequent handling modified the swelling of the muscles. M. A. B.

Differential permeability to water and osmotic exchanges in the marine worm *Phascolosoma*. E. F. Adolph (J. Cell. Comp. Physiol., 1936, **9**, 117—135).—The body wall is impermeable to electrolytes. Permeability to H_2O is greater for endosmosis than for exosmosis, but no differential permeability to org. solutes is shown. M. A. B.

Chemical reactions in suspension of surviving adipose tissue in Tyrode solution. J. Bauer (Enzymologia, 1937, **3**, 183—184).—Exchanges of sugar and chloride between tissue and solution are more vigorous in the presence of O_2, but they are greatly decreased if the tissue is denervated. R. M. M. O.

Physicochemical factors in anopheline ecology. II. Turbidity, chloride, and iron. P. I. de Jesus (Philippine J. Sci., 1937, **62**, 125—136).—*Anopheles* species prefer [Cl′] <7 p.p.m. (no larvæ being found where it exceeds 11 p.p.m.), Fe <0·8 p.p.m., and normally clear H_2O, although temporary accidental increases in turbidity, *e.g.*, after heavy rainfall, are tolerated. R. M. M. O.

Physiology of nematodes. D. G. Davey (Nature, 1937, **140**, 645).—Acidity and the toxicity of bile salts are factors that influence the specificity and distribution within the host of the nematodes from the alimentary canal of sheep. L. S. T.

Catatonia produced by the introduction of heavy water into the cerebrospinal fluid. J. B. Herrmann and H. G. Barbour (Science, 1937, **86**, 244—245).—Catatonia and other effects produced in rats and cats by administration of D_2O are described. L. S. T.

Potassium in frog skin. H. B. Steinbach (J. Cell. Comp. Physiol., 1937, **10**, 51—60).—A transport of K from the inside to the outside of frog skin is demonstrated; it appears to occur through the cells rather than through the extracellular spaces. M. A. B.

Transport of potassium chloride across the myocardium of *Helix pomatia*. A. Jullien and M. Peillon (Compt. rend. Soc. Biol., 1937, **126**, 16—17).—The transport of KCl from the interior to the exterior is very slow and occurs only when the internal pressure is in excess. H. G. R.

Effect of potassium on the aërobic glycolysis of brain tissue with reference to the radioactivity of potassium. Y. Kimura (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, **33**, 231—245).—Pptn. of proteins with $NaWO_4$ gives more concordant recoveries of OH·CHMe·CO_2H than when CCl_3·CO_2H is used. U NH_4 carbonate and $FeCl_3$ afford $Fe(OH)_3$ on which most of the U-*X* is adsorbed. A HCl (1 in 6) solution of the ppt. containing $CaCl_2$, AcOH, and $(NH_4)_2C_2O_4$ with aq. NH_3 affords CaC_2O_4 on which 80—90% of U-*X* is adsorbed. Glycolysis of minced brain is diminished by about 30% in 0·1% KCl, CsCl, and RbCl in contrast with their effects on brain slices (cf. Dickens and Greville, A., 1935, 1013). Preps. of U-*X* used as substitutes for K in Ringer's solution have no significant effect on the aërobic

glycolysis of brain slices. The K effect is shown only when the cell structure is undamaged. J. L. D.

Liberation of potassium by muscle subjected to electrotonus as well as muscle stimulated directly and indirectly. V. Bureau (Arch. Internat. Physiol., 1937, **45**, 40—68).—Liberation of K from muscle subjected to electrotonus or to direct or indirect stimulation is due to ionisation of non-diffusible org. K complexes, the excitability of muscle being due to the ratio between the intra- and extra-fibrillary concn. of K. H. G. R.

Diffusible and non-diffusible potassium of muscle. A. Reginster (Arch. Internat. Physiol., 1937, **45**, 69—74).—The ratio of combined to ionised K in muscle at rest decreases from 2—4 to 1·4—1·8 after prolonged contraction. H. G. R.

Effect of a low-calcium diet on reproduction in cattle. Effects of further reduction in calcium and removal of vitamin supplements. L. S. Palmer, C. P. Fitch, T. W. Gullickson, and W. L. Boyd (Cornell Vet., 1935, **25**, 229—246).—Cows which reproduced normally on a diet containing an average of 0·18% Ca showed no abortion when the Ca content was lowered to 0·12%: the yield, composition, and clotting properties of the milk were unaffected but the total and ultrafilterable Ca of the blood plasma and the ash, $Ca_3(PO_4)_2$, and $CaCO_3$ contents of bones diminished. Withdrawal of cod-liver oil–canned tomato supplements from rations containing 0·18—0·65% of Ca did not affect breeding efficiency, or the yield and composition of milk or composition of muscle; the ash and $CaCO_3$ content of bone and plasma-$Ca^{..}$ diminished slightly.
Ch. Abs. (*p*)

Relation of the calcium content of the diet to rate of healing of experimental fractures in rats. M. A. Robb (J. Amer. Dietet. Assoc., 1936, **11**, 422—427).—Diets deficient in Ca delayed healing, but the supplementing of adequate diets with excessive Ca had no beneficial effect. Ch. Abs. (*p*)

Calcium metabolism and therapy. C. E. Hayden (Vet. Alumni Quart., 1935, **22**, 124—135).—Injection of Ca salts had no effect on acetonæmia but was beneficial in milk fever. Injection of $CaCl_2$ in glucose solution into mammary veins of cows proved toxic. Ch. Abs. (*p*)

Coalescence of living cells with oil drops. I. *Arbacia* eggs immersed in sea-water. R. Chambers and M. J. Kopac. **II. *Arbacia* eggs immersed in acid or alkaline calcium solutions.** M. J. Kopac and R. Chambers (J. Cell. Comp. Physiol., 1937, **9**, 331—343, 345—361).—I. A non-polar oil (Petrofol) which, in sea-H_2O, had an interfacial tension of 38·5—45·5 dynes per cm. independent of p_H penetrated naked *Arbacia* eggs at all p_H vals. of the immersion fluids. Polar oils, including cottonseed oil, olive oil, and oleic acid (I), in which interfacial tension increased with decreasing p_H, penetrated eggs only at low p_H, *i.e.*, when the tension at the oil/aq. interface was > a crit. val. of about 9·5 dynes per cm.

II. Olive oil and (I) penetrate naked *Arbacia* eggs more readily in acid or alkaline aq. $CaCl_2$ than in acid or natural sea-H_2O, probably due to an increase in fluidity of the cell surface, which is assumed to be liquid where penetration occurs. Other cells exist in which the oil does not penetrate but spreads over the cell surface, and here the cell surface is probably solid. M. A. B.

Chondrodystrophy in the chick embryo produced by a mineral deficiency in the diet of the hen. M. Lyons and W. M. Insko, jun. (Science, 1937, **86**, 328; cf. A., 1936, 1541).—Eggs from hens fed on a ration that produces slipped tendon hatch only to an extent of <10%. When $MnSO_4$, $ZnSO_4$, and Fe^{II} NH_4 sulphate are included in the ration the hatching is good and the chicken are normal. Injection of Mn, but not Zn, into the albumin of the eggs prior to incubation also resulted in normal development of the embryos and in an increase in the no. hatched.
L. S. T.

Mineral exchanges in homeo-osmotic fish. A. Drilhon (Compt. rend., 1937, **204**, 1502—1503).—In stenohaline types, cations accumulate in high concns. in the muscles when the fish is gradually introduced into a hypertonic medium so that blood composition is maintained unaltered. Euryhaline types behave similarly during the first hr. following the change, but the muscle-salt content after passing a max. gradually falls to its original val. R. M. M. O.

Effect of adding copper to the exclusive milk diet used in the preparation of anæmic rats, on their subsequent response to iron. M. C. Smith and L. Otis (J. Nutrition, 1937, **14**, 365—371).—Rats rendered severely anæmic by whole milk diet contain residual Fe which is converted into hæmoglobin (I) when adequate amounts of Cu are added to the diet. Animals which have not been depleted of iron by Cu administration in the preparational period regenerate much more (I) during Cu–Fe treatment than do those previously receiving enough Cu to cause exhaustion of Fe reserves. A. G. P.

Effect of salts of heavy metals on protoplasm. I. Action of cupric chloride on the viscosity of sea urchin eggs. C. A. Angerer (J. Cell. Comp. Physiol., 1937, **10**, 183—197).—$CuCl_2$ produces, after a latent period, a decrease of about 36% in η of protoplasm, followed by a rise to an infinite centrifuge val. The rate of change $\propto$ the [$Cu^{..}$] and for a given [$Cu^{..}$] is more rapid in a Ca-, Mg-, or K-free medium. The min. [$Cu^{..}$] necessary to effect the above changes is 5×10^{-4}M in a balanced, K-free or Mg-free medium, but only 10^{-6}M in a Ca-free medium. M. A. B.

Speed with which various parts of the body reach equilibrium in the storage of ethyl alcohol. R. N. Harger, H. R. Hulpieu, and E. B. Lamb (J. Biol. Chem., 1937, **120**, 689—704).—In dogs receiving 3 g. of EtOH per kg. orally or intravenously and examined after intervals of 15 min. to 12 hr., the ratios of [EtOH] in various organs to that in brain were: blood, 1·17 ± 0·09; liver, 0·91 ± 0·07; muscle (after lag lasting 1 hr.), 0·90 ± 0·03. After equilibrium is attained, the EtOH stored $\propto$ the H_2O content of the tissues. The average ratio of [EtOH] in cerebrospinal fluid to that in blood of 46 men was 1·18 ± 0·09, or 0·996 when calc. on the basis of H_2O content. A. L.

Propylene glycol. Rate of metabolism, absorption, and excretion. Determination in body-fluids. A. L. Lehman and H. W. Newman (J. Pharm. Exp. Ther., 1937, **60**, 312—322).—Propylene glycol (I) is determined by oxidation with $NaIO_4$ after pptn. of glucose with $Ba(OH)_2$ in EtOH. (I) is rapidly absorbed from the gastro-intestinal tract of dogs. Large doses taken orally do not produce hæmoglobinuria. Toxicity and narcotic actions are < half those of EtOH. E. M. W.

Changes in bones due to poisoning by iodoacetic acid. F. Verzár and M. Laskowski (Biochem. Z., 1937, **292**, 312—318).—Complete inhibition of growth for 4 weeks in rats due to administration of $CH_2I{\cdot}CO_2H$ is accompanied by absence of change in the Ca, ash, and H_2O contents of the bones; with partial inhibition, the vals. correspond with those of normal rats of equal body-wt. With inhibition of growth due to starvation, however, Ca is deposited and the H_2O content decreases. F. O. H.

Halogenated hydrocarbons. Toxicity and potential dangers. W. F. von Oettingen (J. Ind. Hyg., 1937, **19**, 349—448).—A review of the literature. Narcotic action, depressant effect on heart, antiseptic action, toxicity with oral, subcutaneous, and intravenous administration, and hepatotoxic properties are given for chlorinated hydrocarbons (C_{1-4}). J. N. A.

Action of trihydroxysterocholenic acid on pancreatic lipase and on blood corpuscles. H. Makino (Arb. Med. Fak. Okayama, 1935, **4**, 508—511).—The acid accelerates pancreatic lipolysis less efficiently than does cholic acid but it is a more active hæmolysin. Ch. Abs. (*p*)

Effects of inhalation of smoke from common fuels. L. Schnurer (Amer. J. Publ. Health, 1937, **27**, 1010—1022).—Rabbits and rats were exposed for 80 days to products of combustion of coke, anthracite, and bituminous coal. There was a gain in wt. in every case, and the % of hæmoglobin and no. of erythrocytes and leucocytes increased, the increase being greatest when bituminous coal was used, and least with anthracite. Phagocytosis of the C pigment in the lungs was slight in the case of anthracite and very great with bituminous coal. The products from anthracite and coke caused no fibrosis of the lungs, but early stages were noticed with bituminous coal. J. N. A.

Fractional phthalein test [of kidney function]. E. M. Chapman (New England J. Med., 1936, **214**, 16—18).—Delay in dye excretion following injection of phenolsulphonephthalein is reflected chiefly in the output after 15 min. Tests made after 15—30 min. have the greatest significance. Failure of the test in certain diseases is recorded. Ch. Abs. (*p*)

Resorptive permeability of the toad's ureter towards several diffusible acid dyes studied by intraglomerular micro-injection. L. Lison (Compt. rend. Soc. Biol., 1937, **126**, 56—58).—The cells of the brush segment are permeable to diffusible dyes in both directions. H. G. R.

Elimination of neutral-red by the frog's kidney. R. Chambers and R. T. Kempton (J. Cell. Comp. Physiol., 1937, **10**, 199—221).—Larger amounts of neutral-red (I) are eliminated in an acid than in an alkaline urine. p_H of urine and elimination of (I) are unaffected by perfusion of caffeine through the aorta. Urinary p_H is increased and elimination of (I) decreased by perfusion with KCN or $NH_2{\cdot}CO_2Et$ (III). The effect of KCN and (III) is neutralised by NH_4Cl. M. A. B.

Taste and chemical constitution. Naphtho*iso*-triazine group.—See A., II, 523.

Bulbar centre of carbohydrate metabolism in dogs deprived of their humoral sugar-regulating mechanism. A. Le Grand, J. Cousin, and P. Lamidon (Compt. rend. Soc. Biol., 1937, **126**, 37—38).—The centre of carbohydrate metabolism (A., 1937, III, 212) can be stimulated by induced hyperglycæmia. H. G. R.

Spleen and carbohydrate metabolism. X. Tschahovitsch, R. Berovitsch, and M. Vitschnitsch (J. Physiol. Path. Gen., 1935, **33**, 1114—1119).—Injection of digestion products of the spleen (obtained *in vitro* by digestive enzymes) increased blood-sugar in dogs and rabbits. Splenectomised dogs responded similarly. Ch. Abs. (*p*)

Action of meat extracts and related substances as gastric stimulants in man. W. R. Boon (Brit. Med. J., 1937, 412—413).—The H_2O-sol. fraction of meat is nearly as effective as whole meat in stimulating the flow of gastric HCl. Whole meat (beef powder) is the only substance examined which increased the flow of pepsin. Na glutamate has no stimulative action but causes rapid emptying of the stomach. A. G. P.

Action of extract of the brown fatty tissue of the hibernating hedgehog. C. F. Wendt (Z. physiol. Chem., 1937, **249**, IV).—The basal metabolic rate of rats is reduced by 20—30% by injection of extract of the tissue, which also causes a 28% decrease in the blood pressure in rabbits. The effects are not due to the extract as a whole but to one or more of its constituents. W. McC.

Cholesterol content of the adrenal cortex during experimental hypercholesterolæmia in normal and splenectomised animals. A. Ligas (Arch. Farm. sperim., 1937, **64**, 164—170).—Ingestion of cholesterol by normal rabbits increases the wt., vol., and cholesterol (I) content of the adrenal cortex; the increase in (I) is greater in splenectomised rabbits. F. O. H.

Selective toxicity of lipins of organs. Variation in the intensity of hepatic lesions in guinea-pigs following injection of lipins from guinea-pig liver according to the solvent used for extraction. J. F. Martin, P. E. Martin, and R. Receveur (Compt. rend. Soc. Biol., 1937, **126**, 18—19).—$CHCl_3$ and $C_5H_{11}{\cdot}OH$ fractions are less toxic than $COMe_2$ and EtOH fractions. H. G. R.

Action of drugs on pulmonary circulation. P. Alcock, J. L. Berry, and I. de B. Daly (Quart. J. Exp. Physiol., 1935, **25**, 369—392).—Effects of acetylcholine and adrenaline on pulmonary pressure are examined. Ch. Abs. (*p*)

Modification of the effect of acetylcholine on the right auricle of the tortoise as a function of the p_H. A. Oury (Arch. Internat. Physiol., 1936, **44**, 121—124).—The max. reaction to acetylcholine is between p_H 7·2 and 7·5. H. G. R.

Reaction of the coronary artery to acetylcholine. W. Bärtschi (Pflüger's Archiv, 1936, **238**, 296—306).—The effect of acetylcholine is antagonised by atropine but not by adrenaline. M. A. B.

Effect of gastric juice and of bile on cyclops infected with guinea-worm larvæ. S. Sundar Rao (Indian J. Med. Res., 1936, **24**, 535—540).—Cyclops are killed rapidly by 0·025% HCl, or by gastric juice with total acid concn. 0·026—0·15%; the guinea-worm larvæ are activated. R. N. C.

Activation of tissue-growth (*in vitro*) with cobra-venom. R. N. Chopra, N. N. Das, and S. N. Mukherjee (Indian J. Med. Res., 1936, **24**, 267—271).—The venom stimulates growth at higher dilutions and inhibits it at lower dilutions, possibly due to the effects of different types of enzyme actions on fibrin and the products of such actions. R. N. C.

Liberation of histamine from the perfused lung by snake venoms. W. Feldberg and C. H. Kellaway (J. Physiol., 1937, **90**, 257—280).—The venoms of the Australian copperhead, Indian cobra, and American rattlesnake cause the appearance of coagulable protein (I) and histamine (II) in the perfusates when injected into perfused guinea-pigs' and cats' lungs. The amounts of (I) and (II) liberated increase with the amount of the injection, and copperhead venom is the most active. The (II) liberated is part of the (II) content of the lungs, and with large doses of the venom depletion can become almost complete. R. N. C.

Liberation of histamine from the perfused lung by staphylococcal toxin. W. Feldberg and E. V. Keogh (J. Physiol., 1937, **90**, 280—287).—Staphylococcal toxin causes liberation of histamine (I) from cats' and guinea-pig's lungs after a latent period of 10—40 min., 4—15% of the total (I) being lost. R. N. C.

Liberation of histamine from the perfused lung by peptone. W. Feldberg and W. J. O'Connor (J. Physiol., 1937, **90**, 288—295).—Peptone causes liberation of 1—3% of the total histamine from the lungs of guinea-pigs, and 2—10% from cats. A second injection causes a further output. R. N. C.

Bronchodilating substance from earthworms. T. Q. Chou, C. C. Chang, and H. P. Chu (Chinese J. Physiol., 1937, **12**, 147—153).—A cryst. nitrogenous substance, m.p. >320° (hydrochloride, m.p. >320°), was isolated from earthworms obtained from the province of Kwangtung. It resembles adenosine in its actions on bronchial muscle, blood pressure, and intestine. J. N. A.

Œsophageal and gastric secretion in the frog. M. H. F. Friedman (J. Cell. Comp. Physiol., 1937, **10**, 37—50).—Adrenaline stimulates secretion of (*a*) pepsin (I) by frog œsophageal glands, and of (*b*) (I) and acid by gastric glands. Pilocarpine and acetylcholine are without effect on both (*a*) and (*b*). Histamine stimulates (*a*), but only acid secretion in (*b*). M. A. B.

Tonus of the diaphragm and its relation to smooth muscle tonus in the lungs. F. Verzár, L. Szécsényi-Nagy, C. Haffter, and H. Wirz (Pflüger's Archiv, 1936, **238**, 387—403).—Adrenaline (I) in doses sufficient to raise the blood pressure decreases the tonus of the diaphragm and increases lung vol. Large doses completely arrest respiration. Very small doses (1—10 μg.) may increase tonus. "Pituglandol," an anterior pituitary extract, ephetonine, ephedrine, and acetylcholine (II) also decrease diaphragm tonus. In contrast to (I), the last three decrease blood pressure and (II) does not arrest respiration. Eserine, prostigmine, and histamine (only in lethal doses) produce the same effects as (II). M. A. B.

***cyclo*Propane for anæsthesia. Report of Council.** Anon. (J. Amer. Med. Assoc., 1936, **106**, 292). Ch. Abs. (*p*)

Clinical use of *cyclo*propane and tribromoethanol in amylene hydrate. P. M. Wood (J. Amer. Med. Assoc., 1936, **106**, 275—279).—Use of *cyclo*propane in anæsthesia is considered. Ch. Abs. (*p*)

Relationship between activity, chemical structure, and physico-chemical properties of various anæsthetics. N. V. Lazarev and A. Broussilovska (Bull. Soc. Chim. biol., 1937, **19**, 1173—1193).—Linking a saturated C chain into a polymethylene ring structure, conversion of this into an aromatic ring, introduction of double and triple linkings and of OH groups all lead to a decrease of anæsthetic activity. The introduction of halogens does not materially increase but often slightly decreases anæsthetic activity. P. W. C.

Anæsthetic effects of some *N*-arylbarbituric acids containing dye-forming groups. A. M. Hjort, D. W. Fassett, and E. J. deBeer (Science, 1937, **86**, 291—292).—Intraperitoneal injection into albino mice produced varying effects. 1-*p*-benzeneazo-, 1-*m*- or -*p*-4′-aminobenzeneazo-, 1-*m*- or -*p*-4′-aminonaphthaleneazo-phenyl-5 : 5-diethylbarbituric acids induce true anæsthesia. The 1-*p*- and 1-*m*-2′-azo-α-naphthol-5′-sulphonic acid, derivatives cause a mixed effect in which a convulsive element masks the anæsthetic, and the 1-*p*- and 1-*m*-4′-hydroxynaphthaleneazo-acids are inert. Only the dyes that induce anæsthesia stain the brain tissue as well as the general tissues. L. S. T.

(A) Ether narcosis, blocking of the reticulo-endothelial system, and tissue-chloride. (B) Ether narcosis and tissue-chloride. S. Riolo (Boll. Soc. ital. Biol. sperim., 1937, **12**, 294—295, 295—296).—(A) Blocking of the reticulo-endothelial system in rabbits has no significant effect on the Cl′ content of liver, brain, kidney, spleen, heart, lung, or muscle; with simultaneous Et_2O narcosis, that of the kidney and lung is increased.

(B) Et_2O narcosis in rabbits increases the Cl′ content of kidney and lung and decreases that of the

blood; lethal narcosis slightly increases that of cardiac tissue. F. O. H.

Determination of some volatile narcotics in tissues. A. I. Brusilovskaja and T. V. Staritzuina (J. Physiol. U.S.S.R., 1935, **18**, 935—939).—The tissue, powdered in liquid air, is aërated in a saturated solution of picric acid. The narcotic is passed through a combustion furnace and the CO_2 is determined conductometrically. Ch. Abs. (*p*)

Chemical investigation and medicinal application. A. Binz (Ber., 1937, **70**, [*A*], 127—140).—A lecture dealing with chemical products for combating neurosyphilis and sepsis and the recent developments of C_5H_5N chemistry in chemodiagnostics. H. W.

Pharmacology of natural and synthetic camphor. B. V. Christensen and H. J. Lynch (J. Amer. Pharm. Assoc., 1937, **26**, 786—794).—Natural and synthetic camphor (I) have similar pharmacological properties. Any differences are mainly quant. and not qual., synthetic (I) having a more pronounced action; thus the min. lethal dose in rats is 1·7 and that of natural (I) 2·2 mg. per g. F. O. H.

Pharmacological action of camphor and its derivatives. R. N. Chopra, J. S. Chowhan, and N. De (Indian J. Med. Res., 1936, **24**, 249—255). R. N. C.

Comparison of the pharmacological syndromes of ergometrine and the ergotoxine group of ergot alkaloids. M. R. Thompson (J. Amer. Pharm. Assoc., 1937, **26**, 805—816).—The properties of ergometrine (ergostetrine) (I) and of the ergotoxine (II) group [(II), ergotamine, sensibamine, and ergoclavine] indicate that the action of both (I) and the (II) group is not confined to the sympathetic nerve endings stimulated by adrenaline. The predominating stimulatory action of (I) and paralysing action of the (II) group are discussed. F. O. H.

Action of ajmaline on nerve impulses. R. N. Chopra, N. N. Das, and S. N. Mukherjee (Indian J. Med. Res., 1937, **24**, 1125—1130). R. N. C.

Control of post-operative urinary retention with doryl. R. Officer and J. C. Stewart (Lancet, 1937, **233**, 850—851).—Carbamylcholine chloride produces a marked but short-lived rise of intravesical pressure and, in certain cases, relieves post-operative retention of urine. L. S. T.

Physiological action of drastic purgatives. I. Resins of the Convolvulaceæ. G. Valette (Bull. Sci. Pharmacol., 1937, **44**, 328—340).—Bile or solutions of Na cholate, glyco- and tauro-cholate dissolve 19 times more lecithin in presence of convolvulin (I), jalapin (II), and scammonin (III). The hæmolytic action of bile salts is increased up to 2800 times by (I), (II), and (III). (II) is 3—3·8 times as active as (I) (cf. A., 1918, i, 467). (I), (II), and (III) when hydrolysed by $Ba(OH)_2$ afford (details given) convolvulic (IV) [purgic acid (V) is also formed], jalapic, and scammonic acid (VI), respectively. Unlike (V) and (VI), (IV) has no hydrotropic action on lecithin. The hæmolytic activity of the acids is < that of the parent resins. Scammonolic acid, obtained by acid hydrolysis of (VI), has 0·14 times the hæmolytic action of the latter. J. L. D.

Physiology and pharmacology of the autonomic nervous system. XXII. Sensitisation of adrenaline by antioxidants. XXIII. Liberation of sympathine by chemical stimulation of the sympathetic ganglia. XXV. Rôle of the liver and abdominal viscera in destruction of adrenaline. Z. M. Bacq (Arch. Internat. Physiol., 1936, **44**, 15—23, 112—120; 1937, **45**, 1—5).—XII. The nictating membrane is sensitised to epinine and adrenaline (I) by pyrogallol and the inhibiting action of (I) on the virgin cat's uterus is prolonged. These effects are augmented by enervation, probably due to an increase in fixation of phenolic substances by the tissues.

XXIII. Injection of nicotine or large doses of acetylcholine into the adrenalectomised cat stimulates the sympathetic ganglia with consequent liberation of sympathine.

XXV. Destruction of (I) does not occur in the abdominal viscera and liver *in vivo* as in other tissues. H. G. R.

Pharmacology of sodium tetramethylammonium glycerophosphate. L. Donatelli and P. Pratesi (Boll. Soc. ital. Biol. sperim., 1937, **12**, 349—350).—The pharmacological properties of the compound include those due to the NMe_4 group, *e.g.*, curare-like action, effect on the vagus, and inhibition of the respiratory centre. F. O. H.

Sex-difference in rats in tolerance to barbiturates and nicotine. H. G. O. Holck, M. A. Kanân, L. M. Mills, and E. L. Smith (J. Pharm. Exp. Ther., 1937, **60**, 323—346).—Male rats are more resistant than female to certain barbiturates (I), especially those having one short and one long forked (not *iso*) chain or a *cyclo*hexenyl or methylated N group. This effect is not shown by other animals tested except by mice to pernocton. Castration of male rats increases, and administration of male hormone to spayed or normal female or castrated male rats decreases, recovery time from hypnosis due to (I) showing sex-differences. E. M. W.

Curare-like action of extracts of *Erythrina crista galli*. V. H. Cicardo and E. Hug (Compt. rend. Soc. Biol., 1937, **126**, 154—156).—The active material is probably an alkaloidal base. H. G. R.

Anisylsparteine.—See A., II, 526.

Alkaloid of the Chinese drug "Kuh-Seng."—See A., II, 526.

Chemistry of the vegetable cardiac poisons, toad venoms, and saponins of the cholane group. R. Tschesche (Ergebn. Physiol., 1936, **38**, 31—72).—A review. W. McC.

Biological assay of digitalis preparations in the tropics. VI. Comparative effects of *Digitalis lanata*, Ehrh., from Austria and Kashmir, and standard digitalis powder (B.P. 1932) on the mammalian heart. R. N. Chopra, J. S. Chowhan, and J. C. Gupta (Indian J. Med. Res., 1936, **24**, 509—515). R. N. C.

Plants used by the Indians against snake venom and malaria.—See A., II, 511.

Pharmaceutical applications of furfuraldehyde.—See A., II, 524.

Actions of neostibosan, urea-stibamine, and histamine on the frog's heart. N. M. Basu (Indian J. Med. Res., 1937, **24**, 1131—1135). R. N. C.

Isolation of organic poisons [from viscera etc.]. C. P. Stewart, S. K. Chatterji, and S. Smith (Brit. Med. J., 1937, 790—792).—The minced material is treated with $CCl_3 \cdot CO_2H$. Alkaloids in the fat- and protein-filtrate may be adsorbed on kaolin and subsequently eluted with hot $CHCl_3$. After separation of alkaloids veronal is adsorbed on C and eluted with Et_2O. A. G. P.

Chemical constitution and physiological action. I. Hydro-aromatic compounds. A. Torboli. **II. Linkings in the side-chain.** I. Barducci (Boll. Soc. ital. Biol. sperim., 1937, **12**, 368—369, 370).—I. The toxic properties of *cyclo*hexene in rabbits are slightly more marked than those of *cyclo*hexane.

II. The toxicity to frogs of $CPh{:}C \cdot CO_2H$ (I), $CHPh{:}CH \cdot CO_2H$ (II), and $Ph \cdot [CH_2]_2 \cdot CO_2H$ (III) decreases in the order named. The action of increasing the leucocyte count in rabbits, however, gives the order (II) > (III) > (I). F. O. H.

Cyanide poisoning. Toluylene-red as antidote. P. Salvi (Riv. Biol., 1937, **23**, 211—220).—Toluylene-red (I) (as hydrochloride) has a preventive, but not curative, action in CN' poisoning in dogs. The antidotal action is due to CN' forming complex ions with (I). F. O. H.

Two cases of arsenical poisoning. L. van Itallie (J. Pharm. chim., 1937, [viii], **26**, 289—292; cf. A., 1937, III, 138).—Nails contained 39 mg. and hair up to 7 mg. of As_2O_3 per 100 g. (basal part 2 mg.; apical part 7 mg.). The As, which is held tenaciously by all ectodermal parts, is excreted slowly in the urine. J. L. D.

Pharmaceutically important arsenic compounds.—See A., II, 491.

Relative hypnotic effects of some carbamides of varied types.—See A., II, 491.

Elimination of selenium and its distribution in the tissues. M. I. Smith, B. B. Westfall, and E. F. Stohlman, jun. (U.S. Publ. Health Repts., 1937, **52**, 1171—1177).—From 50 to 80% of the total intake of Se is excreted in urine and from 0 to 18% in fæces, more being excreted in fæces when given orally. A correlation exists between urinary Se and a daily dose administered in chronic Se poisoning. In chronic poisoning, Se is widely distributed in the tissues and is found in highest concns. in liver, kidney, heart, and lungs. Stored Se is excreted in 14 days but some persists in the liver for 30 days. W. L. D.

Toxicology of selenium. IV. Toxicity of hydrogen selenide. H. C. Dudley and J. W. Miller (U. S. Publ. Health Repts., 1937, **52**, 1217—1231).—Guinea-pigs were exposed to H_2Se in concns. of 0·02—0·57 mg. per litre for 10—60 min. Animals exposed to 0·57 mg. per litre died in 5 days, and those exposed to 0·02 mg. per litre for 60 min. within 25 days. W. L. D.

Influence of total extracts of kidney on the toxicity of copper. L. Callegari (Boll. Soc. ital. Biol. sperim., 1937, **12**, 333—334).—Injection of aq. glycerol extracts of kidney greatly increases the toxicity of $Cu^{\cdot\cdot}$ (injected after 15 min.) in rabbits and frogs. F. O. H.

Retention of phenols in blood in a case of mercuric chloride poisoning. M. R. Castex and A. F. Arnaudo (Separate, 1934, 18 pp.).—In $HgCl_2$ poisoning retention of phenols followed that of urea and was accompanied by increase of phenols in spinal fluid. Ch. Abs. (*p*)

Chronic zinc poisoning of pigs [due to] feeding of zinc lactate. R. E. R. Grimmett, I. G. McIntosh, E. M. Wall, and C. S. M. Hopkirk (New Zealand J. Agric., 1937, **54**, 216—223).—Pigs fed regularly on milk containing 0·1% of Zn (as lactate) became lame and ill-conditioned. An accumulation of 0·1—0·2% of Zn occurred in the (damaged) kidney, liver, and the lower end of the leg bones. W. L. D.

Effects of ingestion of fluorides on teeth, bones, blood, and tissues of albino rats. J. A. Schulz (Iowa Agric. Exp. Sta. Rept. Agric. Res., 1934, 51).—Feeding of F' may induce gross physical deterioration of bones and teeth with only minor changes in composition. Ch. Abs. (*p*)

Balance experiments with fluorspar on rats. R. G. Cheng and E. Reid (Chinese J. Physiol., 1937, **12**, 223—231).—F in CaF_2 has about 1/40 of the toxicity of other F compounds as judged by its effect on teeth. Increasing the amount of CaF_2 in the diet also increases the urinary and fæcal excretion of F, but the amount excreted is always a diminishing fraction of that ingested. Balance experiments over long periods of time are untrustworthy. The relatively low toxicity of CaF_2 may be due to its low solubility in digestive fluids. J. N. A.

Basis of the principle of the master reaction in biology. A. C. Burton (J. Cell. Comp. Physiol., 1936, **9**, 1—14).—In a chain of two irreversible unimol. reactions, the ratio of the velocity coeffs. must be $\lessapprox 7 : 1$ in order that the slower reaction may come within 10% of being a true master reaction. In longer chains the relative slowness of a reaction must be even greater. On this basis, for mastery of one reaction at 0° and of another at 40°, the crit. increments of the two reactions must differ by $\lessapprox$ 16,000 g.-cal. if the Arrhenius law of change of velocity with temp. holds. A straight-line Arrhenius graph is not evidence that a master reaction is in control. In the steady state the principle of the master reaction has no application. M. A. B.

"Master reactions" and temperature characteristics. H. Hoagland (J. Cell. Comp. Physiol., 1937, **10**, 28—36).—Reply to criticisms. M. A. B.

Influence of radiation on enzymes and enzymic processes. G. Cronheim (Enzymologia, 1937, **3**, 115—137).—Previous work is reviewed. Somewhat

irregular results are reported from fresh work on several different types of enzyme system.
R. M. M. O.

Mechanism of the regulation of chemical processes in the organism. S. J. VON PRZYŁECKI (Enzymologia, 1937, **3**, 153—163).—A theoretical discussion. R. M. M. O.

Glucose oxidase. I. W. FRANKE and F. LORENZ (Annalen, 1937, **532**, 1—28; cf. Müller, A., 1928, 1291).—The enzyme (I) from *Aspergillus niger* or *Penicillium glaucum* oxidises glucose (II) to gluconic acid. The rate of the (unimol.) reaction $\propto$ concn. of (I), is optimal at p_H 6, and in O_2 is $>$ that in air. (I), which is sp. for (II), is slightly (6—16%) inhibited at p_H 7 and to a greater extent (25—69%) at p_H 4·4 by various narcotics, whilst substances (HCN, H_2S, NaN_3, NH_2OH) reacting with heavy metals either have no effect or accelerate [with production (dependent on p_H) of H_2O_2] the reaction; N_2H_4 and $NaHSO_3$ are inhibitory. *p*-$C_6H_4(NH_2)_2$, especially with horseradish peroxidase, accelerates the oxidation; a similar acceleration occurs with benzoquinone and indophenol derivatives as H acceptors. The properties of (I) indicate it to be not an oxidase but a dehydrogenase. F. O. H.

Tyramine oxidase. H. I. KOHN (Biochem. J., 1937, **31**, 1693—1704).—The prep. of tyramine oxidase (I) from pig's liver is described. (I) does not require a co-enzyme. The rate of oxidation of tyramine decreases with increase of [H·]. (I) catalyses the oxidation of primary, *sec.*, and *tert.* amines to the corresponding aldehyde, H_2O_2, and NH_3. That neither the C_6H_6 ring nor its phenolic nature is necessary is shown by the oxidation of NH_2·$[CH_2]_2$·Ph and *iso*amylamine by (I). 0·01M-CN′, -CH_2I·CO_2H, or -N_2H_4 does not inhibit the oxidation. Adrenaline oxidase and (I) are probably the same. P. G. M.

Adrenaline and amine oxidase. D. RICHTER (Biochem. J., 1937, **31**, 2022—2028).—NH_2·$[CH_2]_2$·Ph, tyramine, and arterenol on oxidation with the amine-oxidase of guinea-pig's liver and intestine form NH_3, adrenaline, epinine, and sympatol give NH_2Me, alkamine gives NH_2Et, and hordenine $NHMe_2$; in each case an aldehyde is also produced. The quaternary salt *N*-methylhordenine chloride was not oxidised.
P. W. C.

Glycerophosphoric dehydrogenase. H. WEIL-MALHERBE (Nature, 1937, **140**, 725—726).—A powerful dehydrogenating enzyme has been prepared from horse brain using pyocyanine as carrier. Addition of co-enzyme I to this dehydrogenase does not affect its ability to take up O_2. Only 0·5 mol. of O_2 is taken up per mol. of α-glycerophosphoric acid with or without co-enzyme I. In presence of CN′, O_2 uptake is practically doubled. L. S. T.

Heavy metal–protein and pyridine–protein complexes as the components of alcohol dehydrogenase sensitive to hydrocyanic acid and carbon monoxide. F. KUBOWITZ (Biochem. Z., 1937, **293**, 308; cf. A., 1937, III, 427; Negelein, *ibid.*, 180).—When pyrocatechol and diphosphopyridine-protein (I) are added to an aq. EtOH solution of Cu-protein (II) containing O_2, EtOH is converted into MeCHO, the hydrogenated C_5H_5N is dehydrogenated (by *o*-quinone) and Cu is re-oxidised by O_2, so that (I) and (II) are re-produced and EtOH and O_2 disappear. The process is inhibited by KCN and by CO.
W. McC.

Enzymic conversion of codehydrogenase-I into -II. R. VESTIN (Naturwiss., 1937, **25**, 667—668).—The conversion of codehydrogenase-I (Harden's cozymase) into -II (Warburg's erythocyte respiration enzyme) is effected enzymically using washed dried yeast as the source of enzyme and an excess of adenosinetriphosphoric acid as PO_4 donator. The formation of -II is max. after 30 min. at 30° and the p_H optimum is 7—8. The abs. amount of -II formed corresponds with only 10% of the cozymase used. The product is active in the dehydrogenation of hexose monophosphate. P. W. C.

Cytochrome-*b*. Isolation, properties, and rôle in the reaction mechanism of cellular respiration. E. YAKUSHIJI and T. MORI (Acta Phytochim., 1937, **10**, 113—123).—The reduction of the three cytochrome (I) components of washed dried yeast by alcohol-dehydrogenase (II) is always dependent on the presence of cohydrogenase (III). Oxycytochrome-*c* (IV) is reduced by C_5H_5N-hæmin but not by dihydrocodehydrogenase (V). The prep. and properties of (I)-*b* are described. Addition of C_5H_5N–$Na_2S_2O_4$ to a solution of (I)-*b* gives a typical C_5H_5N–protohæmochromogen spectrum. A protein prep. from yeast gives with protohæmatin a hæmochromogen which is difficult to distinguish spectroscopically from reduced (I)-*b*. (I)-*b* retards reduction of methylene-blue by (II)—(III), the action increasing with increasing addition of flavoproteins. Oxidised (I)-*b* can be reduced both by (II)—(III) and by lactic dehydrogenase–lactate. Reduced (I)-*b* reacts smoothly with (IV). (I)-*b* catalyses the reaction between (V) and (IV). The mechanism of respiration appears most probably to involve the system O_2–(I)-*c*–(I)-*b*–(III)–(II)–substrate. P. W. C.

Photometric determination of peroxidase and phenolase. L. BARTA (Biochem. Z., 1937, **293**, 228—230).—Willstätter's procedure is improved by using a photometer in place of a colorimeter and clarifying the Et_2O solution of purpurogallin with 2—4 vol.-% of EtOH. W. McC.

Peroxidases. I. Photo-electric comparator for the study of colour development as a function of the time. P. FOURMARIER, jun., and M. FLORKIN (Arch. Internat. Physiol., 1936, **44**, 35—37).
H. G. R.

Catalase of the blood of silkworms bred under unfavourable conditions. K. YAMAFUJI, S. GOTO, and N. IIO (Biochem. Z., 1937, **293**, 305—307; cf. A., 1936, 1554).—In silkworm larvæ insufficient ventilation and exposure to increased temp. and humidity cause reduction in the catalase (I) content of the blood. The reduced (I) val. persists during the period in which no food is consumed. In larvæ of the following generation the (I) content of the blood returns to normal if development proceeds under favourable conditions. W. McC.

Inhibition of catalase action by polyphenols and aromatic polyamines. E. YAKUSHIJI (Bot. Mag. Tokyo, 1937, **51**, 299—302).—The activity of catalase, prepared from ox liver, was reduced 50% by M/900,000 pyrogallol, M/100,000 pyrogallol-4-carboxylic acid, M/25,000 gallic acid, M/20,000 pyrocatechol, M/12,000 quinol, M/5000 resorcinol, M/12,000 p-$C_6H_4(NH_2)_2$, M/4000 m-$C_6H_4(NH_2)_2$, M/6000 p-cresol, or M/8000 α-$C_{10}H_7{\cdot}NH_2$.

W. O. K.

Hepatic arginase. Relationship to production of urea during the autolysis of the liver of vertebrates. A. CLEMENTI (Enzymologia, 1937, **4**, Part II, 205—216).—Formation of urea occurs during autolysis at p_H 8·0—8·5 of the liver [which contains arginase (I)] of fish, amphibia, chelonia, and mammals but not of the liver [which contains no (I)] of reptiles (other than chelonia) and birds.

F. O. H.

Effect of *post mortem* autolysis on the activity of hepatic arginase. G. FLORENCE and D. VINCENT (Compt. rend. Soc. Biol., 1937, **126**, 11—13).—The arginase content remains const. for 2 months after death, decreases by 50% in 4—5 months, and disappears completely after 13—14 months.

H. G. R.

Fumarases. Existence of malic dehydrase. K. P. JACOBSOHN and M. SOARES (Enzymologia, 1937, **3**, 164—169).—The term fumarase is used to cover all enzymes acting on fumaric acid, which is regarded as a pivotal point in metabolism. In resting *B. coli* a malic dehydrase probably exists since decolorisation of indicators is accelerated by malate with a p_H relation distinct from that of the increased activity associated with the addition of fumarate itself.

R. M. M. O.

Enzymic equilibrium in presence of heavy water. Fumarases. A. PEREIRA-FORJAZ, K. P. JACOBSOHN, and J. TAPADINHAS (Bull. Soc. Chim. biol., 1937, **19**, 1194—1199).—The equilibria established by fumarase and aspartase are not materially altered when H_2O is replaced by a medium containing 99·6% of D_2O.

P. W. C.

Inhibition of fumarase action by heparin. A. FISCHER and H. HERRMANN (Enzymologia, 1937, **3**, 180—182).—The inhibition occurs only at p_H 5·5—6·0, increasing steeply towards the lower p_H. Nucleic acid, chondroitin-sulphuric acid, and inactivated heparin are less potent. Heparin forms an irreversible association with fumarase on heating.

R. M. M. O.

Enzymic production of benzamide and hippuric acid. H. WAELSCH and A. BUSZTIN (Z. physiol. Chem., 1937, **249**, 135—156; cf. A., 1935, 1409).—The liver, kidney, blood, and possibly the small intestine (but not the muscles, adrenal glands, or large intestine) of the horse contain an enzyme, benzamidase (I), which converts added BzOH into NH_2Bz. (I) exhibits optimal activity at p_H 7·3 with [BzOH] 0·002M. The action of (I) is inhibited by glycine (II), higher [BzOH], 0·002M-KCN, 0·01M-H_2S, 0·008M-glutathione (III), and 0·004M-cysteine (IV), stimulated by 0·004M-(III) and 0·001M-(IV), and not affected by cystine, glutamic acid, and ascorbic acid. The inhibition by (II) and (in part) that by (III) is due to preferential production of hippuric acid (V). Methods of determining BzOH, NH_2Bz, and (V) in biological material are described.

W. McC.

Cholesterase. S. UTZINO and S. TSUNOO (Z. physiol. Chem., 1937, **249**, 181—182).—Rabbits' blood, liver and kidney of ox and rabbit, and ox spleen contain an enzyme, cholesterase, which hydrolyses the Na salt of cholesteryl H phthalate, exhibiting optimal activity at p_H 7—8.

W. McC.

Plant phenolases. R. M. SAMISCH (Plant Physiol., 1937, **12**, 499—508).—All plant extracts examined oxidised > one phenol, but exhibited preferential action. Ortho-phenolase from avocado and apricot fruit oxidises pyrocatechol rapidly and pyrogallol more slowly and was inactivated at relatively low temp. Meta-phenolase from lemon leaves oxidised phloroglucinol rapidly and resorcinol very slowly and was more resistant to heat. Para-phenolase of pear leaf oxidised quinol and was heat-stable. p_H–activity curves and Michaelis consts. for these enzymes are recorded. Glucosides contain phenols corresponding with the phenolase systems occurring with them in plants. Oxidised forms of phenols are reduced by ascorbic acid in all cases.

A. G. P.

Polyphenolases. E. YAKUSHIJI (Acta Phytochim., 1937, **10**, 63—80).—The prep. is described of a polyphenolase (I) from *Lactarius piperatus* by fractional pptn. with $COMe_2$ and $(NH_4)_2SO_4$. The optimal p_H for its activity varies with the substrate. On reduction with $Na_2S_2O_4$, (I) gives a hæmochromogen band at 550—560 mμ. (I) requires the presence of a free OH or NH_2 group and, with PhOH derivatives, a side-chain in the *o*-position. A pyrocatechol-oxidase (II) is also prepared from *Octaviania columellifera* the activity of which is sp. to the *o*-OH-polyphenols. KCN inhibits (I) and, to a greater extent, (II), whilst CO inhibits (II) but not (I); the inhibition is not abolished by light irradiation. NH_2-acids accelerate the action of both (I) and (II) by combining with the quinones arising by oxidation of the phenols.

P. W. C.

Catalytic oxidation of cytochrome-*c* by various polyphenolases, metal-complex salts, and pyridine-hæmin. T. MORI, K. OKUNUKI, and E. YAKUSHIJI (Acta Phytochim., 1937, **10**, 81—112).—The polyphenolase of *L. piperatus* (cf. preceding abstract), various Co and Ni complex salts (*e.g.*, $[Co(NH_3)_5Cl]Cl_2$), and C_5H_5N-hæmin catalytically oxidise reduced cytochrome-*c* (I). Other complex salts and the pyrocatechol oxidases of *O. columellifera* and potato do not oxidise p-$C_6H_4(NH_2)_2$ and are without action on the oxidation of (I).

P. W. C.

Synthetic action of lipase in adipose tissue. G. QUAGLIARIELLO and F. CEDRANGOLO (Enzymologia, 1937, **4**, Part II, 73—75).—The lipase of fatty tissue (dog, ox) effects esterification of glycerol or BuOH with oleic acid but not with AcOH.

F. O. H.

Specificity of choline-esterase. L. H. EASSON and E. STEDMAN (Biochem. J., 1937, **31**, 1723—1729).—Choline-esterase of serum (guinea-pig, horse) is sp. for choline esters and does not attack $PrCO_2Me$, but

is almost certainly responsible for the slight effect of human serum on tributyrin. P. G. M.

Electrometric determination of choline-esterase activity of blood. Activity in pulmonary tuberculosis. G. Scoz and C. Cattaneo (Enzymologia, 1937, **4**, Part II, 157—162).—The choline-esterase (I) activity (determined by electrometric titration of hydrolysis of acetylcholine) of blood is diminished in tuberculosis. In normal and diseased men, and also after administration of atropine or adrenaline, the (I) content of the blood is parallel to the arterial blood pressure. F. O. H.

Method of the Italian Pharmacopœia of determining peptic activity. E. Rovida (Boll. Chim. farm., 1937, **76**, 500, 503).—The I.P. V method is compared with those of other Pharmacopœias and modifications are suggested. F. O. H.

Enzymes of blood-serum. II. Amylase content of human serum. III. Esterase contents in tuberculous patients. N. Sugiyama (Sci-i-Kwai Med. J., 1935, **54**, 1531—1538).—II. In males the amylase content is max. at 50—59 and min. at 40—49 years of age. In females the max. occurs at 13—19 and min. at 50 years.

III. The esterase index in tuberculosis is 82% < normal and decreases with increasing severity of the disease. Ch. Abs. (*p*)

Distribution of various enzymes in intermediate regions of animals with certain blood-vessels and organs excluded by anastomosis. I. Amylase. E. S. London and N. Kotschnev (Enzymologia, 1937, **4**, Part II, 239—241).—In dogs with exclusion of intestine, liver, salivary glands, spleen, kidney, and muscle, no change occurs in the serum-amylase level. Injected amylase is selectively absorbed by the organs in the order liver > kidney > salivary gland > muscle > spleen. F. O. H.

Enzymic histochemistry. XXIII. Distribution of amylase in the outer layers of the barley grain. K. Linderstrøm-Lang and C. Engel (Enzymologia, 1937, **3**, 138—146).—The aleurone cells are poor in amylase but the boundary layer between these and the starch cells is rich, containing 15% of the total present in the grain. Previous to germination β-amylase alone is present, and only 1/3 of that present is active. Subsequently the total amylase increases, the active proportion remaining about the same, whilst some α-amylase also appears in the boundary layer. R. M. M. O.

[Plant-]amylases. M. Bolli (Atti R. Accad. Lincei, 1937, [vi], **25**, 519—524).—Aq. amylase extracts from germinating seeds exhibit a specificity of varying degree with starches from the same family of plants but are inactive with those of other families. Amylolytic action by embryos grown on filter-paper moistened with H_2O or 0·2% aq. $H_2C_2O_4$ or by caryopses grown on gelatin media indicates that the variation in specificity is at least partly due to differences in acidity of the media. The *in-vivo* activity of amylases is discussed. F. O. H.

Activation of malt amylase by shaking. O. Holmbergh (Svensk Kem. Tidskr., 1937, **49**, 252—255).—Aq. solutions of amylase (I) are inactivated by shaking with PhMe or $CHCl_3$. This is inhibited by the products of reaction of (I) on starch, but is unaffected by the addition of maltose. In presence of EtOH α-(I) is inhibited less rapidly than β-(I), thus providing a method for the purification of α-(I). M. H. M. A.

β-Amylase from ungerminated barley. K. Myrbäck and B. Örtenblad (Biochem. Z., 1937, **293**, 107—117).—The extraction of amylase, its instability in EtOH, salting out with $MgSO_4$, pptn. with $HgCl_2$, adsorption on Al_2O_3, ZnO, and kaolin, and subsequent elution and dialysis of its solutions are investigated. Considerable inactivation occurs in most of these processes. P. W. C.

Enzymic hydrolysis of trimethylcarbinol-β-*d*-glucoside. S. Veibel (Enzymologia, 1937, **3**, 147—152).—The rate of this hydrolysis is very slow in comparison with that of methyl-β-*d*-glucoside, but computation of the rates of dissociation of the hypothetical enzyme–substrate complex into free enzyme and products of the reaction gives consts. showing far less difference, viz., $0{\cdot}05 \times 10^{-2}$ and $2{\cdot}93 \times 10^{-2}$. R. M. M. O.

Specificity of glucosidases. I. Behaviour of β-*d*-glucosidases of different sources with β-*d*-glucosides with varying aglucones. T. Miwa, C. T. Cheng, M. Fujisaki, and A. Toishi (Acta Phytochim., 1937, **10**, 155—170).—The behaviour of β-glucosidase (I) preps. from 15 different sources (plant, mould) against β-glucosides (II) having 4 different aglucones (PhOH, saligenin, *o*- and *p*-cresol) is determined and a table summarises their relative activities. The seeds of species of *Prunus* contain large amounts of (I) and the enzyme preps. from them have about the same activity, the (II) of *o*-cresol being hydrolysed most quickly and of *p*-cresol most slowly. The enzyme preps. of seeds of other phanerogams are less active and vary more amongst themselves. The enzyme preps. from various moulds (all ascomycetes) are powerfully active but the (II) of saligenin and *o*-cresol are hydrolysed less rapidly than that of PhOH (*i.e.*, reverse of *Prunus* results). P. W. C.

Kinetics of catalysed sugar hydrolysis as a function of temperature. I. W. Sizer (J. Cell. Comp. Physiol., 1937, **10**, 61—77).—During the log phase of the reaction the crit. increment for the catalysis of sucrose (I) inversion by yeast invertase (II) has a const. val. of 12,000 over the temp. range 4—45°. It is independent of p_H changes from 3·2 to 7·9 and of (I) or enzyme concn., and is unaltered by the presence of various electrolytes. The same val. is found for inversion of raffinose by (II); this supports the view that the crit. increment is characteristic of the catalyst and not of the reaction. For (I) inversion by malt invertase the crit. increment is 13,000. Since the course of the inversion and the temp. of heat-inactivation are different from those for (II), it is probable that the two invertases are chemically distinct. M. A. B.

Detection and characterisation of isodynamic pyrophosphatases. E. Bamann and H. Gall

(Biochem. Z., 1937, **293**, 1—15).—In animal organs there exist three isodynamic pyrophosphatases which, with $Na_4P_2O_7$ as substrate, have p_H optima respectively at 3·9—4·2, 5·2—6·0, and 7·6—8·3. Methods are described for their separation from one another and from phosphatase by selective inactivation. P. W. C.

Co-enzymes. H. VON EULER (Angew. Chem., 1937, **50**, 831—836).—A lecture.

Cozymase. H. VON EULER (Ergebn. Physiol., 1936, **38**, 1—30).—A review. W. McC.

Action of phosphorus oxychloride on cozymase. F. SCHLENK (Naturwiss, 1937, **25**, 668).—Co-dehydrogenase-I is converted on treatment with $POCl_3$ in dry Et_2O into a product which dehydrogenates hexose monophosphate and is probably identical with codehydrogenase-II. P. W. C.

Phosphomonoesterase. Y. OHMORI (Enzymologia, 1937, **4**, Part II, 217—231).—The enzyme (I) is determined in blood and tissues by methods based on hydrolysis of *p*-nitrophenyl (colorimetric) or hexyl phosphate (stalagmometric). The three types of (I) (from pig's kidney, yeast, and rice-bran) have p_H optima at 3·2, 5·6, and 9·0, respectively, and occur in rabbit's erythrocytes and organs. F. O. H.

Phosphatases and phosphateses of milk. A. CONTARDI, C. RAVAZZONI, and L. OSELLA (Enzymologia, 1937, **3**, 170—179).—A phosphatese action with optimum p_H 2·5 was demonstrated in samples of milk from several groups of cows. It is intensified by lactose, galactose, and HCN, but not by the oxidation system present in an extract of orange pips. Ascorbic acid destroys this action, an acidic phosphatase becoming active in its place. R. M. M. O.

Action of phosphatases of green leaves on formaldehyde monophosphate. P. PRATESI (Enzymologia, 1937, **4**, Part II, 242—245).—The phosphatases of optimum p_H 5·0 and 8·0 preferentially hydrolyse β- and α-glycerophosphate, respectively; they differ also in their action on hexose diphosphate. The possibility of phosphates participating in the photochemical formation of sugars in plants is discussed. Polyoxymethylene with H_3PO_4 in sealed tubes at 140—145° affords *Ca formaldehyde monophosphate*, probably $OH{\cdot}CH_2{\cdot}O{\cdot}CaPO_3$. F. O. H.

I. Presence of phosphatases in green leaves. II. Specificity of phosphatases of green leaves. P. PRATESI (Annali Chim. Appl., 1937, **27**, 309—321, 321—328).—I. The fresh leaves of 16 plants examined contained phosphatases (I) which hydrolyse Na β-glycerophosphate and, to a smaller extent, Na sucrose phosphate. The optimum p_H varies from 4·2 to 6·7 with the different preps. whilst the inhibitory action of NaF is also dependent on p_H.

II. At p_H 4·7, preps. of (I) hydrolyse β- more readily than α-glycerophosphoric acid (II). The hydrolysis of 3-phosphoglyceric acid (with formation of glyceric acid) indicates (I) to be phosphoesterases. Preps. of (I) exhibit no optical specificity in the hydrolysis of (II). F. O. H.

Manometric determination of fermentation and equivalent carbonic acid in two-buffer systems. H. DIECKMANN and H. MOHR (Biochem. Z., 1937, **292**, 332—349).—Theoretical considerations of determinations in buffer systems of, *e.g.*, PO_4'''–CO_3''–HCO_3' are given and a suitable type of apparatus is described. F. O. H.

Aspartase activity of yeast. H. HAEHN and H. LEOPOLD (Biochem. Z., 1937, **292**, 380—387).—Autolysates of bottom yeast hydrolyse *l*-aspartic acid at p_H 8·0 with formation of fumaric acid but have no action on glutamic acid, glycine, alanine, and leucine. F. O. H.

Phosphorus exchange in yeast. G. HEVESY, K. LINDERSTRØM-LANG, and N. NIELSEN (Nature, 1937, **140**, 725).—Analyses of yeast grown in solutions containing radioactive P as Na phosphate show that no exchange of P atoms takes place between the yeast and the culture solution. L. S. T.

Effect of a water-soluble carcinogenic substance on metabolism of yeast carbohydrates. Y. POURBAIX (Compt. rend. Soc. Biol., 1937, **126**, 92—94).—"Styryl 430" inhibits yeast respiration and glycolysis and increases the incubation period of zymase. H. G. R.

Chemical processes during cell division. III. Inhibition and re-establishment of cell division. L. RAPKINE (J. Chim. phys., 1937, **34**, 416—427; cf. A., 1936, 1291).—At p_H 4·4—7·24, the inhibition by 0·001M-$CH_2I{\cdot}CO_2H$ (I) of fermentation by *Schizosaccharomyces Pombe* becomes more marked with time, but the rate at which (I) penetrates the cells decreases as the p_H rises (cf. A., 1932, 1065). Reduced glutathione (II), but not cysteine or thioglucose, gradually restores to the yeast the power of cell division inhibited by long contact with 0·0003M-(I). It is suggested that the (I) penetrates the cell, combines with ·SH groups, making them inactive, and the (II) has a sp. effect in restoring the ·SH content. The rate of inhibition by 0·0005M-I of yeast-cell division and the rate of restoration of cell division by (II) is > in the case of (I) (cf. A., 1933, 865). J. G. A. G.

Two types of spore germination: genetic segregations in *Saccharomyces* demonstrated through single spore cultures. Ö. WINGE and O. LAUSTEN (Compt. rend. Lab. Carlsberg, 1937, **22**, 99—116).—Technique for the isolation and cultivation of the four spores in an ascus of *Saccharomyces ellipsoideus* and for the germination of the spores in two different ways is described. H. G. R.

Rôle of glutathione in the metabolism of yeast. S. MACHLIS and K. C. BLANCHARD (J. Cell. Compt. Physiol., 1937, **9**, 207—216).—Respiration and aërobic fermentation in yeast are not affected by addition of reduced glutathione (I) or cysteine. There is a correlation between (I) content of the cells and the ratio of the quantities of glucose utilised by respiration and aërobic fermentation. The ratio of reduced to total (I) in the cell is not altered by destruction of a large proportion of reduced (I) by $CH_2I{\cdot}CO_2H$ or I. Intracellular oxidation and reduc-

tion of (I) is reversible. A second oxidation–reduction system maintains most of (I) in the reduced state. M. A. B.

Mechanism of carbohydrate dissimilation in bakers' yeast. T. J. B. Stier and J. N. Stannard (J. Cell. Comp. Physiol., 1937, **10**, 79—92).—Measurement of the rates of endogenous respiration of yeast over the temp. range 4° to 27° showed a R.Q. of 1 at all temp., both for the phase of const. rate and the phase of first order decline. The crit. increment was 16,000 for both phases. The mechanisms involved are discussed in the light of the above results. M. A. B.

Chemical constitution of "cerebrin" of beer yeast. E. Ruppol (Bull. Soc. Chim. biol., 1937, **19**, 1164—1172).—The formula $C_{42}H_{85}O_5N$ attributed by Reindel (A., 1930, 920) to cerebrin should be $C_{46}H_{91}O_4N$. On hydrolysis it gives a OH-acid, $C_{28}H_{56}O_3$ (a homologue of cerebronic acid), and sphingosine, $C_{18}H_{37}O_2N$. Reindel's substance of m.p. 83—84° is probably methylsphingosine. P. W. C.

Velocity of sedimentation of yeast. N. Nielsen (Compt. rend. Trav. Lab. Carlsberg, 1937, **22**, 61—87).—A method is described for the determination of sedimentation velocity (v). Concordant results are obtained under specified conditions, but a statement of the time of sedimentation must be made. v is much affected by cultural conditions, being great in solutions poor in growth factors but small in, *e.g.*, beer wort, which is rich in such factors. v with NH_2-acids or peptone as source of N is significantly > with $(NH_4)_2SO_4$, but the [N] is of little importance. v falls somewhat with increasing age of yeast cells and also with increasing temp. of cultivation. p_H is of little significance. The vals. of v for a no. of yeasts and yeast-like organisms are compared. I. A. P.

Measurement of the growth of yeast from changes of p_H in the culture medium. V. Hartelius (Compt. rend. Trav. Lab. Carlsberg, 1937, **22**, 89—98).—The method of Boas (Angew. Bot., 1936, **18**, 351) for determination of yeast growth in presence of varying concns. of growth factor (log wt. of yeast dry substance + p_H = const.) appears to be valid only within certain limits, *e.g.*, with 2—$\frac{1}{8}$% of wort added to mineral nutrient solutions containing sugar; with concns. < $\frac{1}{8}$% very large errors appear. Dry wt. of yeast is here used instead of the original cell count, but the ratio cell count : dry wt. is reasonably const. I. A. P.

Influence of alkaloids on the fermentative power and multiplication of yeast. C. Enders and F. M. Wieninger (Biochem. Z., 1937, **293**, 22—29).—Investigation of the stimulatory (at low concn.) and inhibitory (at higher concn.) action of quinine, papaverine, caffeine, cinchonine, and pilocarpine on the growth of yeast for 24 and 48 hr. shows that the toxicity of these alkaloids (reckoned in terms of a 25% inhibition) decreases in the order given. At higher concns., the fermentative power is inhibited to the same extent as the multiplication. P. W. C.

Mechanism of cellular death through high pressure. Modifications accompanying death in yeast. B. Luyet (Compt. rend., 1937, **204**, 1506—1508).—Pressure influences both permeability and coagulation. Staining with methylene-blue is taken as index of death; this occurs in 20% of cells exposed to 4800 atm. for 2 min. and in 75% with 6000 atm. The cytological effects are described. The smallest cells are killed selectively; their cell membranes show no structural disintegration. Sudden release of pressure has no special effects. R. M. M. O.

Fungicides. I. Influence of hydrogen-ion concentration on the growth of yeast-like organisms. II. *In vitro* tests with chemicals on yeast-like organisms and other fungi. H. C. Hesseltine and W. J. Noonan (J. Lab. Clin. Med., 1935, **21**, 281—287).—I. Pathogenic fungi isolated from vaginal and oral mycoses show optimum growth at p_H 5·5 but in many cases were active at p_H 7·0—7·5. Fungistatic action occurred at p_H <4·0 and >7·5.

II. No universal fungicide is suitable for clinical use since closely related yeast-like organisms vary in susceptibility. Data for a no. of fungicides are given. Ch. Abs. (*p*)

Detection of hydrogen sulphide production by micro-organisms. M. Feldman and C. A. Hunter (Proc. S. Dakota Acad. Sci., 1935, **15**, 41—45).—Suitable culture media are described. Ch. Abs. (*p*)

Preparation of fat by micro-organisms.—See B., 1937, 1232.

Representation of biochemical and epidemiological reactions by Pearson's curve IV. Dufrenoy and Vezian (Rev. Microbiol. Appl., 1937, **3**, 135—143).—Five instances are given of experimental distributions, relating to mould biochemistry and bacterial infections, which are shown to conform to this type of curve. L. D. G.

Absorption of organic acids by fungi. J. Fournier and D. Bach (Bull. Sci. Pharmacol., 1937, **44**, 353—366).—Absorption of $H_2C_2O_4$, lactic acid, and AcOH by *Aspergillus niger*, *A. repens*, etc. at different p_H indicates that org. acids penetrate the cell as neutral mols. or electrically neutral complexes. γ and fat solubility also play a part. When penetration is rapid, the cellular buffer system is destroyed and death follows. This action may be modified by protective mechanisms. E. M. W.

Production of polyhydroxyanthraquinones by moulds. H. Raistrick (Enzymologia, 1937, **4**, Part II, 76—78).—Emodin Me_1 ether from *Aspergillus ruber* is identical with physcion from the lichen *Xanthoria parietina*, L. (cf. A., 1937, II, 107). F. O. H.

Mechanism of enzyme action. XV. Enzymic transformations by *Fusarium lini*, Bolley, and *Fusarium oxysporum*. F. F. Nord, H. Hofstetter, and E. Dammann (Biochem. Z., 1937, **293**, 231—255; cf. A., 1937, III, 66).—*F. oxysporum* has a more powerful dehydrogenase system than, but otherwise does not differ in biochemical behaviour

from, *F. lini*. Phosphorylation of sugar by living *F. lini* ceases after a definite proportion of the inorg. PO_4''' present has been transferred, is independent of changes in concn. of substrate or PO_4''', and is not affected by addition of adenosinephosphoric acid (I) or PhMe. It is probable that under optimal conditions complete consumption of inorg. PO_4''' or complete phosphorylation of substrate does not occur but equilibrium between free (inorg.) PO_4''' and bound (org.) PO_4 is attained. Fresh *F. lini* contains 0·4 mg. of (I) per 100 g. and fresh *F. oxysporum* the same concn. of adenosinetriphosphoric acid (II). The growth of the fungi is promoted by adding (I) or (II) to the medium, the (I) and (II) contents of the fungi being greatly (up to 30-fold) increased. Phosphorylations at p_H 4—7 do not proceed more rapidly with the enriched than with the non-enriched fungi. W. McC.

Enzymic decomposition by *Fusaria*. Effect of adenylic and adenosinetriphosphoric acid on the living cell during alcoholic fermentation and dehydrogenation by *Fusaria*. F. F. Nord, H. Hofstetter, and E. Dammann (Naturwiss., 1937, **25**, 652).—With fermentation by *Fusaria* at p_H 4—7, addition of adenylic acid (I) or adenosinetriphosphoric acid (0·2M) increases the activity of the mycelium to an extent not proportional to the increase in available (I). At p_H 3·5, the addition of (I) doubles the production of CO_2 with formation of org. phosphoric esters at the expense of (I). This phenomenon occurs not only when carbohydrates (glucose and arabinose) are fermented but also when alcohol is dehydrogenated. The effect is most marked after a P deficiency of the cells lasting 4—6 days. Under anaërobic conditions, the activity of the cells and particularly the dephosphorylation of (I) are inhibited. W. O. K.

Action of degradation products of aneurin on *Phycomyces*. Second growth-factor of *Mucoraceæ*. W. H. Schopfer and A. Jung (Compt. rend., 1937, **204**, 1500—1501).—Aneurin (I) enables the organism to synthesise its own growth-factors. Activity in (I) preps. not accounted for by their (I) content is perhaps related to the products of heat-inactivation. The two fission products of (I) are inactive alone but in appropriate mixture have the same activity as a corresponding amount of (I). (I) is probably not utilised as such but only after splitting of the mol. R. M. M. O.

Origin of spiral growth in *Phycomyces*. E. S. Castle (J. Cell. Comp. Physiol., 1936, **8**, 493—502).—Spiral growth probably is due to interaction between turgor and elastic forces in the chitin membrane of the cell, and not to the structure of the chitin mol. M. A. B.

Longevity of sclerotia of certain fungi under controlled environmental factors. Y. Nisikado and K. Hirata (Ber. Ōhara Inst. Landw. Forsch., 1937, **7**, 535—547).—The viability of sclerotia of *Sclerotinia* and *Hypochnus* species immersed in H_2O was similar to that when pre-soaked in 10% NaCl and > that when stored in the air-dry condition. A. G. P.

Effect of one organism on the parasitic activity of another. R. S. Vasudeva (J. Indian Bot. Soc., 1935, **14**, 71—83).—Activity of *Botrytis cinerea* is lowered by the presence of other organisms or of the staled substrate of other organisms or in aq. extracts of their spores, but is accelerated by aq. extracts of its own spores or those of *B. allii*. The latter and *Penicillium* species diminish the activity of internal and external enzymes of *B. cinerea* when grown in mixed cultures but not when the enzymes are prepared from separate cultures. Ch. Abs. (*p*)

Microchemical colorimetric p_H procedure for differentiating the telia of *Cronartium ribicola* and *C. occidentale*. R. J. Acree and W. H. Goss (J. Agric. Res., 1937, **55**, 347—352).—Leaves bearing the telia are treated with 0·1N-HCl and washed. Telia are removed with a scalpel to a slide and treated with bromophenol-blue at p_H 7·6. *C. ribicola* is stained blue and *C. occidentale* green. A. G. P.

Effects of salts on emergence from the cyst in protozoa. K. V. Thimann and A. J. Haagen-Smit (Nature, 1937, **140**, 645—646).—In *Colpoda cucullus*, excystment is produced by the Na and K salts of oxalic, succinic, acetic, fumaric, tartaric, and citric acids. The salts and not the free acids are active, K and Na salts being approx. of equal activity. Activity decreases with increasing mol. wt., heptoic and azelaic acids forming the upper limits in their series. It is markedly increased by a β-OH. A mixture of carbohydrates and PO_4''' imitates the Et_2O-insol. residue in increasing the activity of these salts. Some of the salts themselves increase the apparent activity of the others. L. S. T.

Effect of silicon on growth and respiration in *Chilomonas paramecium*. S. O. Mast and D. M. Pace (J. Cell. Comp. Physiol., 1937, **10**, 1—13).—Si increases rates of growth and respiration in *C. paramecium* mainly by catalysing the synthesis of complex org. compounds. M. A. B.

Action of fluorescent dyes on paramecia as affected by p_H. L. V. Beck and A. C. Nichols (J. Cell. Comp. Physiol., 1937, **10**, 123—132).—Basic (cyanine and acridine) dyes are, in general, more toxic in the dark and have a stronger photodynamic action at p_H 7·4 than at 6·2. The reverse is true for acid (fluorescein) dyes. M. A. B.

Effect of some chemotherapeutics on metabolism of trypanosomes in reference to interference phenomena. G. Scheff and A. Hasskó (Zentr. Bakt. Par., 1936, I, **136**, 420—424).—Parafuchsin (I), trypaflavin (II), and neosalvarsan (III) depress the O_2 and sugar consumption of flagellates, diminution of sugar decomp. being observed before changes in respiration. Na thioglycollate and (I) protect the organism against the influence of (II) and (III). Accumulation of dyes and their therapeutic action are not identical processes. Chemotherapeutics incapacitate the CN′-insensitive H_2-carrier system of the trypanosomes. A. G. P.

Insoluble ferrocyanides and putrefaction of organic matter. L. Pilati (Boll. Chim. farm., 1937, **76**, 471—473).—$Fe_4[Fe(CN)_6]_3$ in presence of

putrefying meat for some months yields small amounts of CN′. F. O. H.

Bacteriochlorophyll *a*. H. Fischer and R. Lambrecht (Z. physiol. Chem., 1937, **249**, I—III; cf. A., 1935, 362, 1270; 1937, III, 122).—The formulæ for bacteriomethylphæophorbide *a* (I), bacteriochlorin Me_3 ester (II), and bacteriopurpurin Me_8 ester are $C_{36}H_{10}O_6N_4$, $C_{37}H_{44}O_7N_4$, and $C_{37}H_{42}O_8N_4$, respectively. (I) with H_2SO_4 and O_2 followed by esterification with CH_2N_2 gives 2-acetylmethylphæophorbide identical with the *b*-component obtained from bacteriophæophytin by the action of HCl in MeOH. Similarly (II) gives 2-acetylchlorin Me_3 ester. Bacteriochlorophyll derivatives and acetylchlorophyll derivatives of the *a* series are attacked by chlorophyllase and hence their structures are similar to that of chlorophyll. (I) and (II) on dehydrogenation with $Cu(OAc)_2$ and AcOH consume 0·61 and 0·52 mol. of O_2, respectively. W. McC.

Physiology of *Azotobacter*. I. Respiration of *A. chroococcum* with special reference to N_2 assimilation and CO inhibition. H. Kubo (Acta Phytochim., 1937, **10**, 219—238).—AcOH, $PrCO_2H$, and hexoic and octoic acids are oxidised by *A. chroococcum*. The respiration is not completely inhibited by 0·001M-KCN, and some other respiration systen in addition to cytochrome must be present. EtOH and $Bu^{\alpha}OH$ are utilised for respiratory purposes and the presence of dehydrogenase systems for MeCHO and EtOH are detected by the methylene-blue technique. NH_2OH and NH_4 salts inhibit N_2 assimilation but NH_4 salts permit growth and increased O_2 utilisation. Respiration in a N_2-free atm. in presence of mannitol is greatly decreased on adding NH_2OH. The bearing of the results on the mechanism of respiration is discussed. P. W. C.

Prevention of assimilation in respiring cells. C. E. Clifton (Enzymologia, 1937, **4**, Part II, 246—253).—With the oxidation (to CO_2, CH_2O, and H_2O) of OAc′ and $PrCO_2'$ by suspensions of *Pseudomonas calco-acetica*, Beijerinck, in PO_4''' buffer, assimilatory processes are inhibited and oxidation of the substrate is completely effected by $CH_2I{\cdot}CO_2H$, NaN_3, 2 : 4-dinitrophenol, or $NH_2{\cdot}CO_2Me$. The effects of these poisons on respiration and synthesis indicate a close relationship between the two processes. Similar phenomena occur with *Bacterium coli* and *Spirillum serpens*. The analogy of the results with those of mammalian tissue respiration is discussed. F. O. H.

Fluorescence of photosynthesising cells. D. Vermeulen, E. C. Wassink, and G. H. Reman (Enzymologia, 1937, **4**, Part II, 254—268).—The fluorescence spectra (apparatus described) of living photosynthesising unicellular organisms (green alga *Chlorella* and purple S bacterium *Chromatium*) are independent of λ of the incident light. With both organisms, the max. val. of absorption of the green pigments is closely related to the spectral distribution of the fluorescent light. The fluorescent light-energy is 0·15 and 0·005%, respectively, of the incident energy; when the absorbed light is expressed in quanta, the yield of fluorescence is independent of those spectral regions where only chlorophyll and bacteriochlorophyll, respectively, absorb light. F. O. H.

Aërobic oxidation of carbohydrates by luminous bacteria : inhibition of oxidation by certain sugars. F. H. Johnson (J. Cell. Comp. Physiol., 1936, **8**, 439—463).—Numerous carbohydrates and carbohydrate alcohols were tested as substrates for *Vibrio phosphorescens* and *Achromobacter fischeri* and the influence of concn. on rate of oxidation was studied. Only compounds with 3 or 6 C were oxidised. *A. fischeri* oxidised only reducing compounds, with the exception of glycerol (I) and melezitose. In all cases acid was produced by the O_2 oxidation. The rate of oxidation of glucose was not increased by fructose, mannose, galactose, or (I). In some cases non-oxidisable compounds inhibited the oxidation of other compounds of similar configuration, probably by competitive action for the adsorptive surfaces. Those compounds which were most readily oxidised were most effective in maintaining luminescence, and inhibition of oxidation inhibited maintenance of luminescence. M. A. B.

Hexose oxidation by luminous bacteria. I. Effect of some natural and synthetic glucosides and related substances. F. H. Johnson (J. Cell. Comp. Physiol., 1937, **9**, 199—206).—Oxidation of hexoses is stimulated or retarded by certain glucosides which do not affect endogenous respiration. A given glucoside may increase or decrease O_2 consumption according to the hexose substrate used. Methylglucosides have a much greater effect than oligosaccharides. Luminescence is not markedly increased by any of the substances, but is decreased by phloroglucinol and kojic acid. M. A. B.

Osmotic and surface properties of marine luminous bacteria. F. H. Johnson and E. N. Harvey (J. Cell. Comp. Physiol., 1937, **9**, 363—380).—Transference of the bacteria from sea-H_2O to distilled H_2O causes cracking of the cell membrane and loss of cell contents, luminescence, and motility and the suspension becomes foamy. The cells do not dissolve completely, but the suspension becomes clearer and the bacteria more difficult to centrifuge. These latter changes, which result from changes in the salt-sensitive colloidal outer layer of the cells, can be reversed by adding traces of Ca or Mg, whereas foaming and cessation of luminescence and motility which are due to loss of cell contents cannot be reversed. M. A. B.

Rate of carbon dioxide assimilation by purple bacteria at various wave-lengths of light. C. S. French (J. Gen. Physiol., 1937, **21**, 71—87).—The rate of assimilation of CO_2 by the photosynthetic bacterium *Spirillum rubrum* when irradiated by light of different λ is at a max. at λ = 590 and 880 mμ. These correspond with the absorption max. in the spectrum of the bacteriochlorophyll; hence this and not the carotenoids (absorption max. 490, 510, and 550) acts as a light-absorber for CO_2 reduction. E. M. W.

Metabolism of purple bacteria. III. Presence of a hydrogenlyase in *Rhodobacillus palustris* and its rôle in the mechanism of bacterial

photosynthesis. H. NAKAMURA (Acta Phytochim., 1937, **10**, 211—218; cf. A., 1937, III, 356).—*R. palustris* in the dark and N_2 forms H_2 and CO_2 from formate and from glucose, the Q_H vals. being 100 and 30 and the $H_2 : CO_2$ ratios 1·07 and 10, respectively. When, however, the cultures are kept in the light, the H_2 formation from formate becomes only 5% whilst that from glucose is 81% of that in the dark. Formate does not but butyrate and glucose do act as H donators for reduction of methylene-blue. The meaning of the results in terms of the hydrogenase and hydrogenlyase contents of the cells and of bacterial photosynthesis is discussed. P. W. C.

Nutritive value of pentosans. VIII. Xylan-decomposing bacteria. H. IWATA (J. Agric. Chem. Soc. Japan, 1937, **13**, 978—988).—Very active, new species of bacteria have been isolated from the cæcum and rumen which decompose xylan (I) into xylose and small amounts of lactic acid and AcOH, HCO_2H, and CO_2. They hydrolyse starch, dextrin, inulin, melezitose, raffinose, trehalose, melibiose, lactose, sucrose, maltose, and salicin. The optimum p_H is 6·8—7·4 at 37°. They are harmless to rats and mice, and probably are necessary for higher animals on diets containing (I). J. N. A.

Growth-factors for bacteria. VI. Fractionation and properties of an accessory factor for lactic acid bacteria. E. E. SNELL, F. M. STRONG, and W. H. PETERSON (Biochem. J., 1937, **31**, 1789—1799; cf. A., 1937, III, 316).—The growth of various lactic acid bacteria, grown in media containing acid-hydrolysed peptone, glucose, NaOAc, cystine, tryptophan, riboflavin, and inorg. salts, is promoted by the addition of a factor (I) present in an EtOH-sol. liver extract. Preps. of (I) are sol. in Et_2O, unstable to heat and alkali, somewhat labile to mild treatment with Br or HNO_2, and active in concns. of $0·3 \times 10^{-6}$%; (I) appears to be distinct from any of the known plant or bacterial growth-factors. W. O. K.

Metabolism of the strict anaërobes (*Clostridium*). VI. Hydrogen production and amino-acid utilisation by *C. tetanomorphum*. D. D. WOODS and C. E. CLIFTON (Biochem. J., 1937, **31**, 1774—1788).—*C. tetanomorphum* grown anaërobically on a tryptic digest medium produces H_2 and CO_2. Washed suspensions of the bacteria decompose *l*-glutamic acid, *dl*-serine, and *l*-aspartic acid, -histidine, -cysteine, -tyrosine, and -methionine with formation of H_2, CO_2, and NH_3. Cystine is also attacked, but only traces of H_2 are evolved. Pyruvate, fumarate, *l*-malate, *d*-glucose, *d*-maltose, and glycerol are also decomposed with evolution of H_2 and CO_2. W. O. K.

Colon group of [bacteria from] fish. Y. YASUKAWA (Bull. Agric. Chem. Soc. Japan, 1937, **13**, 751—758).—Characteristics and reactions of *B. coli* isolated from intestinal tracts of fish and from human fæces are compared. J. N. A.

Influence of photodynamic substances on the ability of *Bact. coli* to ferment lactose. G. GUERRINI (Zentr. Bakt. Par., 1936, I, **136**, 241—243).—Eosin, fluorescein, and æsculin inhibit lactose fermentation at higher and have a stimulatory effect at lower concns. Crit. concns. differ for various strains of *B. coli*. Me-violet at all concns. examined had a stimulative action. A. G. P.

Urea metabolism in relation to terrestrial dynamics. E. CASTELLANI (Riv. Biol., 1937, **23**, 50—62).—Soil bacteria with appropriate nutrition cause an increase in sol. and replaceable Ca of the soil. With degradation of added urea, the Ca decreases owing to its replacement by NH_4^+, $CaCO_3$ being formed. The part played by the colloidal and ionic constituents of the soil is discussed. F. O. H.

Bactericidal action of *B. mesentericus* filtrates on the diphtheria bacillus. P. WEILAND (Zentr. Bakt. Par., 1936, I, **136**, 451—456).—A filterable, heat-resistant substance having a sp. bactericidal action on the diphtheria bacillus diffuses from cultures of *B. mesentericus* into the culture medium. A. G. P.

Immuno-chemistry. II. Isolation and properties of a specific antigenic substance from *B. dysenteriæ*, Shiga. W. T. J. MORGAN (Biochem. J., 1937, **31**, 2003—2021; cf. A., 1936, 898).—A method is described for the isolation of certain bacterial antigens by extraction with various solvents, *e.g.*, ethylene, diethylene, and trimethylene glycols, glycerol, at neutral reaction and at normal or low temp. The sp. antigen of the "smooth" form of *B. dysenteriæ*, thus isolated, is free from protein, does not exceed 6—7% of the original wt. of the mass of organisms, is not destroyed by trypsin at p_H 8·5, and is readily hydrolysed by dil. acid to give 48% of its wt. of the sp. polysaccharide, $[\alpha]$ +98°, N 1·8%, and 28% of material (N 7·1, P 0·8%) insol. in H_2O. The antigenic material induces an antibacterial immunity response which is qualitatively identical with that produced by the sp. antigen of the intact micro-organisms. P. W. C.

Function of hæmin as growth-factor for *Hæmophilus influenzæ*. A. LWOFF and M. LWOFF (Compt. rend., 1937, **204**, 1510—1512).—Limiting dilution of hæmin (I) for peptone–yeast extract media is represented by an addition of 1 in 4—5×10^6 of blood. Organisms isolated from cultures show an O_2 uptake which is increased 200—400% by such addition of (I), but diminishes after 1—2 hr. R. M. M. O.

Physiology of respiration of bacteria. III. Oxidation of various phenols and phenylene-diamines by *Bacillus pyocyaneus*. S. YAMAGUTCHI (Acta Phytochim., 1937, **10**, 171—198; cf. A., 1936, 1422).—The increase in O_2 absorption by cultures of *B. pyocyaneus* on addition of 14 phenols, diamines, etc. is greatest with *p*-$C_6H_4(NH_2)_2$ (I) and decreases in the order (I) > tyrosine (II) > quinol (III) > pyrocatechol (IV) > *o*- (V) and *p*-$NH_2 \cdot C_6H_4 \cdot OH$ (VI) > resorcinol (VII), pyrogallol (VIII) ≥ *o*- (IX) and *m*-$C_6H_4(NH_2)_2$, *m*-$NH_2 \cdot C_6H_4 \cdot OH$, phloroglucinol, *o*-, *m*-, and *p*-cresol. Heating the bacilli at 52° for 90 min. before addition of PhOH did not decrease this O_2 absorption with (I), (III), and (VI) but led to a reduction by >70% with (IV), (VII), (VIII), (V), (II), phenylalanine, alanine, and lactic and succinic acids. The O_2 absorption is also inhibited by >70% by 0·001M-KCN with (I), (III), (VI), and

(II), but is either not or <30% inhibited with (IV), (VII), (VIII), and (V). The prep. is described of a cell-free enzyme extract which readily oxidises (I), (III), and (VI), less readily (IV), (IX), and (V), less readily still (VIII), and does not attack the remaining substances. The oxidation by this enzyme extract of (I), (III), and (VI) is considerably inhibited by 0·001M-KCN. The extract oxidises cytochrome-*c*. The results are discussed in respect of the mechanism of bacterial oxidations. P. W. C.

Improved medium for demonstration of hydrolysis of sodium hippurate by *Streptococci*. J. M. Coffey and G. E. Foley (Amer. J. Publ. Health, 1937, **27**, 972—974).—The medium contains pepsin 0·5, $CaCl_2$ 0·003, Na hippurate 1, and asparagine 0·1% instead of peptone 1%. J. N. A.

Polysaccharides produced by *Bacterium typhi flavum*. I. Malek (Compt. rend. Soc. Biol., 1937, **126**, 127—130).—The chemical and serological reactions of polysaccharide fractions obtained with EtOH are discussed. H. G. R.

Importance of β-receptors for the life of bacteria. K. Aoki (Z. Immunitäts., 1937, **91**, 153—156).—After subculturing on PhOH–agar or Endo agar about 30 times typhoid bacilli lost both α-receptors, while the β-receptors were unchanged. Types of oriental hog cholera, paratyphoid *B*, and typhoid bacilli which agglutinated only with difficulty retain both the α- and the β-receptors. C. R. S.

Nucleic acid of proteins of *Vibrio choleræ* and related organisms. B. N. Mitra (Indian J. Med. Res., 1936, **24**, 1—4).—Nucleic acid is extracted from the proteins by treatment with 1% NaOH at 37°. It contains cytosine and uracil, but no thymine. R. N. C.

Absorption spectra of the proteins of *Vibrio choleræ* and related organisms. B. N. Mitra (Indian J. Med. Res., 1936, **24**, 5—12).—The type I pseudoglobulins give identical absorption curves, as do the type II pseudoglobulins, but the two curves differ considerably from each other. The differences become more pronounced in the course of incubation with 0·05N-NaOH at 37°, the max. in the type I curve, initially at 270 mμ., tending to move up the scale, whilst the position of the max. in the type II curve varies irregularly. R. N. C.

Vibrio polysaccharides. R. W. Linton and B. N. Mitra (Indian J. Med. Res., 1936, **24**, 323—330).—Arabinose (I) is identified in presence of glucose and galactose in hydrolysates of vibrio polysaccharides (II) by isolation of hexosazones from a portion of the hydrolysate and destruction of the hexoses in the remainder by fermentation with yeast, which does not affect (I). Growth of the organisms on agar does not cause contamination of (II) by the medium. All three types of (II) exist in the cells as Ac derivatives, which are hydrolysed during extraction of (II) with alkali. The Ac and deacetyl forms of each type of (II) differ from each other and from the corresponding forms of the other types, in $[\alpha]_D$. All contain about 3% of N and 0·6% of NH_2-N. Type I can be extracted completely from the cell as its Ac derivative, but in the other types a considerable amount requires deacetylation before it can be extracted. R. N. C.

Agglutination in the vibrios. I. Effect of heat on chemical structure and surface potential. II. Effect of salt and sera. R. W. Linton, B. N. Mitra, and S. C. Seal (Indian J. Med. Res., 1936, **24**, 19—35, 331—348).—I. The total amount of polysaccharide (I) in vibrios is unchanged by heating in buffer solution at p_H 7·0, or in 0·9% NaCl, but the (I) tends to pass into the supernatant fluid. The "A" fraction (see A., 1935, 761) of the solid material also tends to pass into solution, but neither its composition nor that of the "B" fraction is appreciably altered; the residue fraction, however, shows a fall in total N and NH_2-N, and an increase in humin-N, indicating a progressive mild hydrolysis. The supernatant fluid shows a sharp rise in NH_2-N and a progressive increase of AcOH-precipitable substances, largely (I) and protein hydrolysis products; EtOH-precipitable substances and free sugars also show increases. The appearance of NH_2-N in the supernatant fluid is correlated with a rise in the surface potential. These effects are all concerned in bringing about the destruction of the "*H*" antigen.

II. Variable concns. of NaCl affect the surface potentials of vibrios according to the general principles governing colloidal flocculations. The potential falls with increasing [NaCl], without causing agglutination as the cohesive force is also depressed. Individual strains vary as regards potential, but cataphoresis fails to differentiate the chemical groups. R. N. C.

Effect of sodium chloride on the phage–bacterium reaction. E. J. Scribner and A. P. Krueger (J. Gen. Physiol., 1937, **21**, 1—16).—The presence of 0·25M-NaCl during the reaction between a susceptible staphylococcus and its homologous phage has no effect on bacterial growth, rate of phage production, or phage distribution up to the point of lysis, but delays lysis by approx. 0·7 hr. During the delay, phage concn. increases 5—10 times but measurements of turbidity and O_2 consumption indicate that there is no bacterial growth. E. M. W.

Inhibition of individual types of cholera bacteriophage by vibrio extracts. C. G. Pandit and N. M. Maitra (Indian J. Med. Res., 1936, **24**, 13—18).—The extracts when classified according to their phage type inhibitions fall into three groups, which are generally similar to the groups obtained by Linton *et al.* according to the respective polysaccharides of the strains (cf. A., 1936, 761). R. N. C.

Thermostability of vaccine virus. V. D. Tsiakov and M. N. Dodonov (Vestn. Mikrobiol., 1937, **15**, 301—306).—Sugar and albuminous vaccines are more stable at 37° than glycerinated or dry ones and are recommended for human vaccination. W. O. K.

p_H stability range of the elementary bodies of vaccinia. J. W. Beard, H. Finkelstein, and R. W. G. Wyckoff (Science, 1937, **86**, 331—332).—The activity of the vaccine virus is preserved for ≮ a week at p_H 5—9·5; inactivation proceeds rapidly

at p_H 4 and 10·5, and is practically instantaneous at p_H <3 and >11·5. Pure elementary bodies of vaccinia were obtained after several passages of the virus in rabbit skin; the sedimentation const. is approx. 5×10^{-10} cm. per sec. per dyne. Infectivity tests and ultracentrifugal analysis show that solutions or suspensions of the elementary bodies are stable probably only in very dil. salt solutions; the homogeneity of suspensions in 0·1M-neutral buffer rapidly disappears. Decomp. at p_H 11·8 gives much unsedimentable material and a substance with a sedimentation const. of approx. 19×10^{-11}, one third that of the active elementary bodies. The sedimentation const. of the bodies is unaltered by p_H in the region where the activity is unaffected. L. S. T.

Virus of tobacco-mosaic. X. Activity and yield of virus-protein from plants diseased for different periods. W. M. Stanley (J. Biol. Chem., 1937, **121**, 205—217; cf. A., 1937, III, 228).—Virus-protein (I) in inoculated leaves of Turkish tobacco plants increases more than 10^6-fold in 4 days, the rate of increase being greatest during the first 3 weeks and the max. content being attained in 5 weeks. The total N content of extracts of infected plants remains approx. const. for long periods but the protein-N content increases to a max. and then decreases. As the amount of (I) increases the amount of protein of low mol. wt. decreases. The activity of (I) increases when the period of infection is increased from one to two weeks but not when it is increased from 2 to 13 weeks. W. McC.

Artificially-prepared visible paracrystalline fibres of tobacco mosaic virus nucleoprotein. R. J. Best (Nature, 1937, **140**, 547—548).—Fibres prepared from solutions of the pure virus-protein by suitable adjustment of p_H and salt and virus concns. have the same dimensions and properties as those formed spontaneously (A., 1937, III, 228). The presence of nucleic acid in the virus mol. has been confirmed. L. S. T.

(A) **Molecular sedimentation constants of tobacco-mosaic virus-proteins extracted from plants at intervals after inoculation.** R. W. G. Wyckoff. (B) **Ultracentrifugal isolation of latent mosaic virus-protein.** H. S. Loring and R. W. G. Wyckoff (J. Biol. Chem., 1937, **121**, 219—224, 225—230; cf. A., 1937, III, 100).—(A) In the plants the protein (I) consists of one mol. species only having sedimentation const. 174×10^{-13} cm. sec.$^{-1}$ dynes.$^{-1}$ The susceptibility of (I) to the action of salts [PO_4''', $(NH_4)_2SO_4$] increases with age (2—13 weeks). An approx. const. amount of a second species of protein having sedimentation const. 200×10^{-13} cm. sec.$^{-1}$ dynes^{-1} occurs in 2—3-week samples.

(B) The average yields of (I) of mol. wt. approx. 9×10^6 from 100 c.c. of the juice of infected Turkish *Nicotiana tabacum* and *N. glutinosa* are 4·9 and 10·5 mg., respectively. The concn. of (I) in the juice is of the order of 0·01 g. per 100 c.c., 99·9% being isolated by ultracentrifuging, which produces 1000- to 10,000-fold increase in the (I) concn. The sedimentation const. of (I) is 113×10^{-13} cm. sec.$^{-1}$ dynes^{-1}. It is usually accompanied by a heavier protein having sedimentation const. 131×10^{-13} cm. sec.$^{-1}$ dynes.$^{-1}$ W. McC.

Physiology of plant viruses. H. M. Franke (Biochem. Z., 1937, **293**, 39—63).—Determination by the quinhydrone electrode of the anaërobic potential in leaf press-juice or tissue-pulp does not give comparable results but the disturbing substances can be removed by centrifuging and the potential determined in 0·5 c.c. of centrifugate. With *Nicotiana tabacum*, the p_H for individual leaves of the same plant did not differ greatly but of different plants differed by as much as 0·9, the old yellow leaves being more acidic and the young shoots more alkaline. Plants infected with virus show considerable alkalosis, increased buffering, and a changed titration curve. A variety of plants was similarly investigated. P. W. C.

Lysozyme. E. Gildemeister (Zentr. Bakt. Par., 1936, I, **136**, 408—412).—The mol. size of lysozyme is < that of bacteriophage. A. G. P.

Some thermostable bacteriolysins and the lysozyme question. P. Spanier (Rev. Microbiol. Appl., 1937, **3**, 67—72).—A general discussion. L. D. G.

Nucleolytic nature of lysozyme. P. Spanier and D. Deribas (Rev. Microbiol. Appl., 1937, **3**, 61—66).—Ovalbumin and human tears both show the presence of an active nucleotidase. The bacteriolytic properties of lysozyme preps. are attributed to this enzyme. L. D. G.

Hydrolase content of certain bacteria. G. Vercellana (Zentr. Bakt. Par., 1936, I, **136**, 225—230).—In numerous species of bacteria examined no enzymes absolutely identical with trypsin, cathepsin, amylase, or lipase from animal sources could be identified. A. G. P.

Oligodynamic action of silver with special reference to silver halides. S. Ikeda (Zentr. Bakt. Par., 1936, I, **136**, 269—278).—Ag plates activated by oxidants have a bactericidal action > that of plates activated by HCl. Among electrolytically activated plates those prepared with $NaCrO_4$ were the most effective; those activated in KI or KCN exhibited marked inhibitory properties in media free from protein and Cl′. The oligodynamic action of Ag is not dependent on p_H. In agar substrates diffusion of $Ag^{\cdot}$ from activated plates is recorded. In Cohn's solution the bactericidal action of Ag_2CrO_4 is > that of AgCl; that of AgBr and AgI is markedly weaker. On the basis of equal [$Ag^{\cdot}$] the relative toxicity of the salts is Br′, I′>Cl′>CN′. The presence of Br′ inhibits the action of AgBr > that of AgCl and Cl′ inhibits the effect of AgCl > that of AgBr. Org. matter inhibits the action of dissolved Ag salts. A. G. P.

Antiseptic properties of alkyldimethylbenzylammonium chloride. P. G. Heineman (J. Amer. Pharm. Assoc., 1937, **26**, 711—717).—The compound (in which the alkyl group is a mixture of $C_{8-18}H_{17-37}$ derived from coconut oil) has a high PhOH coeff. (up to 318 in H_2O and 154 in serum) when tested against various micro-organisms, and readily destroys

spores of *Bacillus subtilis* and of two types of fungi. It has a disinfecting, but non-irritating, action on the human skin. F. O. H.

Effect of vitamin-*C* and its organo-metallic complexes on the development and the fermenting power of *B. coli*. F. Arloing, A. Morel, A. Josserand, L. Thévenot, and R. Caille (Compt. rend. Soc. Biol., 1937, **126**, 5—7).—Development of *B. coli* is diminished but the fermenting power increased by the addition of ascorbic acid (I), dehydroascorbic acid (II), or their complexes. The activity of Fe, Pb, and Ti complexes of (I) or (II) is < that of the Na salts, whereas Cu complexes inhibit growth completely. H. G. R.

Bacteriostatic action of *p*-aminobenzenesulphonamide on hæmolytic streptococci. H. Finklestone-Sayliss, C. G. Paine, and L. B. Patrick (Lancet, 1937, **233**, 792—795).—The bacteriostatic action of p-$NH_2 \cdot C_6H_4 \cdot SO_2 \cdot NH_2$ (I) on hæmolytic streptococci is preceded by a phase of growth stimulation which is more pronounced in young cultures than in cultures that have passed through the logarithmic phase of growth. (I) is more sol. in the fatty envelope that can be separated from hæmolytic streptococci than in aq. solution. It does not appear to modify the activities of polymorphonuclear leucocytes. (I) stimulates the phagocytic activity of reticulo-endothelial cells of rabbits, and the production of polymorphonuclear leucocytes by the bone-marrow. L. S. T.

Disinfectants of the urinary passage. I. Influence of hydrogen ions on the degradation of various drugs, especially arbutin. II. Additive complexes of urotropine and dihydric phenols. B. Cacciavillani (Boll. Soc. ital. Biol. sperim., 1937, **12**, 277—278, 278—280).—I. The efficacy and dependence on p_H of urinary antiseptics are discussed. Arbutin (I) is only slowly hydrolysed at $p_H < 1$ and > 11 and hence is useless as an antiseptic.

II. The additive compounds of $(CH_2)_6N_4$ with (I), resorcinol, and pyrocatechol (1 : 1, 1 : 1, and 1 : 2 mols., respectively) have properties suggesting their unsuitability as urinary antiseptics. F. O. H.

Skim-milk agar for routine milk counts. C. E. Safford and C. N. Stark (J. Dairy Sci., 1937, **20**, 577—582).—Tryptone–glucose–skim-milk agar containing 0·5 and 2·0% of skim-milk gave counts 180 and 215% higher, respectively, than standard agar for pasteurised milk. The 2% skim-milk agar further possesses differential val. for bacterial types which applies for the examination of other dairy products and for starters. W. L. D.

Simple tellurite–chocolate–agar medium for typing and isolation of *Corynebacterium diphtheriæ*. G. A. W. Neill (J. Hyg., 1937, **37**, 552—560).—A simple peptone broth–laked blood-mixture–K tellurite–agar medium is described. W. L. D.

Pipettes for bacteriological investigations. A. Pasveer (Chem. Weekblad, 1937, **34**, 619).—The markings on 2-c.c. pipettes graduated in 0·1-c.c. divisions, as used for measuring samples of milk, are made by fusing short lengths of blue glass rods on the outside of the instrument. The method used for fixing the strips is described. S. C.

Response of the skin blood vessels to hormones. W. Springorum (Pflüger's Archiv, 1936, **238**, 353—360).—Adrenaline produces constriction of the blood vessels in the skin; histamine and acetylcholine cause dilatation. M. A. B.

Inactivation of adrenaline. H. Blaschko, D. Richter, and H. Schlossmann (J. Physiol., 1937, **90**, 1—17).—Rat-liver slices accelerate the inactivation of adrenaline (I) in presence of O_2. (I) increases the O_2 uptake of extracts of liver, kidney, and intestines of rats, guinea-pigs, and rabbits. CN' does not completely inhibit (I) oxidation by the extracts, one atom of O being taken up per mol. of (I); this oxidation is inhibited by narcotics, but not by CO or glutathione. The inactivating system is non-dialysable and thermolabile. It contains an oxidising substance which is neither carbohydrate nor protein, and also an inhibitor of autoxidation, which is not effective above p_H 8·0. The rate of oxidation of *l*-(I) is double that of *d*-(I). R. N. C.

Seasonal variations in the sensitivity of the muscular arteries of *Rana temporaria* to adrenaline. F. Karasek and O. Poupa (Compt. rend. Soc. Biol., 1937, **126**, 113—116).—Variations in the sensitivity of the arteries to adrenaline during spawning are attributed to changes in the concn. of the sex hormones in the blood. H. G. R.

Atrophy of the adrenal cortex of the rat produced by the administration of large amounts of cortin. D. J. Ingle and E. C. Kendall (Science, 1937, **86**, 245).—This effect is prevented by the simultaneous administration of a fraction of anterior pituitary extract which has high adrenotropic activity. L. S. T.

Aggravation of pancreatic diabetes by anterior pituitary extract. V. G. Foglia, R. Gerschman, A. D. Marenzi, J. M. Munoz, and C. T. Rietti (Compt. rend. Soc. Biol., 1937, **126**, 152—153).—The symptoms are intensified by the extract, but insulin decreases the intensity of the effect. H. G. R.

Pituitary humoral regulator of protein depots in the liver. T. Y. Liang and S. W. Wu (Chinese J. Physiol., 1937, **12**, 125—137).—Extracts of anterior pituitary gland contain a substance (I) which is identical with that in the blood of fasting dogs or cats, and causes complete disappearance of the liver-protein when injected into rats. (I) is not identical with any other hormones prepared from the gland, is sol. in H_2O, insol. in EtOH, $CHCl_3$, and $COMe_2$, thermolabile, and unstable to 0·1N-HCl and -NaOH, and is adsorbed on $Fe(OH)_3$ but not on C or kaolin. J. N. A.

Internal secretions and milk production. F. Hogreve (Z. Züchtung, 1937, B, **35**, 299—378).—Published work on the relationship of lactation and endocrine glands is reviewed. Administration of various pituitary and follicular hormone preps. did not affect production of milk or milk-fat by lactating goats and cows. Growth of the lacteal glands and secretion of milk (up to 1 litre per day), however, can

be induced in virgin goats, whilst the development of lacteal glands and secretion of milk in a male goat receiving hormone treatment are recorded. F. O. H.

Test for prolactin based on films of the mucous membrane of the crop. J. R. Valle (Compt. rend. Soc. Biol., 1937, **126**, 134—136).—The films are examined for the appearance of fat staining with Sudan III. H. G. R.

Effects of the thyrotropic hormone of the anterior pituitary in man. E. F. Scowen (Lancet, 1937, **233**, 799—802).—Thyrotropic hormone prepared from the anterior pituitary gland of the pig increased the metabolic rate in man in health and in cases of pituitary insufficiency, but is without effect in myxœdema. Hence the thyroid gland in man is under the control of the anterior pituitary gland, and in the absence of stimulation from the pituitary, thyroid function ceases, and variations in the amount of stimulation by the thyrotropic hormone regulate the degree of thyroid activity. L. S. T.

Effect of gonadotropic hormone on the degradation of histidine in the liver. R. Kapeller-Adler and G. Boxer (Biochem. Z., 1937, **293**, 207—218; cf. A., 1935, 1525).—The power of human (male and female) liver pulp to decompose histidine (I) is almost halved by addition of $\leqslant 20$ rat units of gonadotropic hormone (II). The extent of the reduction is not affected by varying the amount of (II) from 50 to 500 rat units or by inactivating it (*e.g.*, with H_2SO_4). The action of partly purified histidase from liver on (I) is only occasionally inhibited by (II). Material obtained from the urine of non-pregnant women in the same way as (II) is produced from that of pregnant women has no effect on the power of liver to decompose (I). W. McC.

Gonadotropic activity of amphibian anterior pituitary. H. Zwarenstein (Nature, 1937, **140**, 588).—Implantation of the anterior pituitary from *Xenopus lævis* into immature white mice produced ovarian, uterine, and vaginal responses showing that the gonadotropic substance of amphibian anterior pituitary can activate the mammalian reproductive apparatus. L. S. T.

Absorption and excretion of œstrone by the human organism. T. Kemp and K. Pederson-Bjergaard (Lancet, 1937, **233**, 842—845).—3—12% of œstrin (I) administered to men or to castrate women is soon excreted in the urine; the proportion excreted is greater after oral than after parenteral administration. (I) is very rapidly absorbed and excreted in the former case and has therefore a comparatively low sp. biological action. L. S. T.

Effect of litter size on growth and of œstrone administered during lactation (of rat). A. M. Hain (Quart. J. Exp. Physiol., 1935, **25**, 303—313).—Injection of œstrone in lactating rats did not induce œstrus but prolonged the diœstrus interval. Large dosages caused abnormal development in the urogenital region in suckling and in new-born females. Ch. Abs. (*p*)

Degradation of folliculin in cold-blooded animals. P. Engel and E. Navratil (Biochem. Z., 1937, **292**, 434—437).—Frog's liver-pulp destroys >75% of added folliculin (I) whilst muscle-pulp is without action. Perfusion of (I) solution through the (dead) frog's liver does not produce inactivation whilst (I) injected into the lymph sac of normal or hepatectomised living frogs is destroyed to the extent of >93% in 48 hr. F. O. H.

Origin of folliculin and gonadotropic hormones. L. Cattaneo (Riv. Biol., 1937, **23**, 14—19).—Perfusion of human, surviving placenta with Locke-Ringer's solution in presence of O_2 results in the production *de novo* of folliculin and gonadotropic hormones *A* and *B*. F. O. H.

Action of folliculin and anterior pituitary extracts on gastric secretion. G. de Lisi (Riv. Biol., 1937, **23**, 23—32).—Experiments with normal and thyroidectomised dogs indicate that folliculin (I) stimulates gastric secretion directly and also indirectly by acting on the thyroid glands. Anterior pituitary extract also stimulates directly, an indirect or delayed effect being due, not to its action on the thyroid, but to its ability to cause hypersecretion of (I). F. O. H.

Synthesis of folliculin in the organism of females with avitaminosis-*A*. B. A. Kudrjaschov (Bull. soc. nat. Moscou, Sect. biol., 1935, **44**, 45—56).—Avitaminotic rats produced much folliculin when the ovaries were stimulated with prolan (I). No vitamin-*A* appeared in the livers of these animals. Massive injections of (I) produced a prolonged and uninterrupted œstrus. Ch. Abs. (*p*)

Effect of progestin on the growth response of the uterus to chronic distention. S. R. M. Reynolds and W. M. Allen (Anat. Rec., 1937, **68**, 481—488). R. N. C.

Effect of prolan on the calcium balance in frogs. L. di Bella (Boll. Soc. ital. Biol. sperim., 1937, **12**, 386—387).—The elimination of Ca by frogs is increased by injection of prolan to an extent approx. ∝ the amount injected. F. O. H.

Influence of the spleen and various glands of internal secretion on experimental hypercalcæmia. S. Riolo (Boll. Soc. ital. Biol. sperim., 1937, **12**, 293—294).—The hypercalcæmia due to injection of Ca gluconate into rabbits is not significantly affected by removal of the spleen, adrenals, ovaries, or testes. F. O. H.

Blood-sugar and -cholesterol of splenectomised and castrated animals treated respectively with testicular and splenic extracts. A. Ligas (Boll. Soc. ital. Biol. sperim., 1937, **12**, 301—303).—Splenectomy or castration in rabbits increases the blood-sugar and -cholesterol. The levels in normal rabbits are unaffected by testicular extracts but are diminished by splenic extracts. The (increased) levels in splenectomised rabbits are unaffected by testicular extracts whilst those in castrated rabbits are diminished (*i.e.*, tend towards normal vals.) by splenic extracts. F. O. H.

Active principles of the male generative glands. H. Dannenbaum (Ergebn. Physiol., 1936, **38**, 796—835).—A review. W. McC.

Genesis of the testicular hormone. Biochemical transformation of Δ^5-androstenedione into *iso*androstanediol and Δ^4-testosterone. L. Mamoli and A. Vercellone (Ber., 1937, **70**, [*B*], 2079—2082; cf. A., 1937, III, 199).—Addition of Δ^5-androstendione in EtOH to a fermenting mixture of sucrose and top yeast affords *iso*androstanediol, m.p. 163—164°, $[\alpha]_D^{25}$ +4·3°, with small amounts of Δ^4-testosterone. The unexpected hydrogenation of the double linking is ascribed to its presence in the $\beta\gamma$ position to CO. H. W.

Augmentation of the vascular effect of adrenaline by testosterone. F. Karasek and O. Poupa (Compt. rend. Soc. Biol., 1937, **126**, 116—118). H. G. R.

Modification of the vascular effect of adrenaline by sex hormones of the opposite sex. F. Karasek and O. Poupa (Compt. rend. Soc. Biol., 1937, **126**, 118—119).—The augmentation of the action of adrenaline by the sex hormones is sp. for the sex. H. G. R.

Rapid test for the male hormone. Mitosis in the accessory genitalia of castrated male rats. T. Martins (Compt. rend. Soc. Biol., 1937, **126**, 131—134).—Colchicine is injected 14 hr. after injection of the male hormone and karyokinesis can be observed in the seminal vesicles and prostate. H. G. R.

Transformation of male sex hormones into a substance with the action of a female hormone. E. Steinach and H. Kun (Lancet, 1937, **233**, 845).—Administration of testosterone propionate or androsterone benzoate to men results in the excretion in the urine of increasing amounts of œstrogenic substance. L. S. T.

Inhibition of menstruation and ovulation by means of testosterone propionate. S. Zuckerman (Lancet, 1937, **233**, 676—680).—Adequate amounts of testosterone propionate inhibit menstruation in normal mature rhesus monkeys for an indefinite period. No injury results to the internal reproductive organs. Follicular growth and luteinisation are both inhibited. L. S. T.

Effect of enol-esters of testosterone. K. Miescher, W. H. Fischer, and E. Tschopp (Nature, 1937, **140**, 726—727).—The effect of the di-esters on the capon's comb is, in general, less intense but more prolonged than that of the mono-esters. With a 10-day injection test on the rat, the effect of the enol-esters on the seminal vesicles is < that of testosterone propionate; the longer is the chain of the acid groups the less is the effect. When the temporal course of a single injection is considered, however, the activity of the diacetate is between that of the monoacetate and the propionate; the remaining enol-esters exert a more extensive influence. Testosterone 3-acetate 17-butyrate exhibits the most prolonged effects of the known compounds of the male sex hormone series. L. S. T.

Benzanthracene derivatives.—See A., II, 497.

Conversion from the androstane to the pregnane series.—See A., II, 505.

Œstrogenic substance from the demethylation of anethole.—See A., II, 495.

New compounds of the follicle hormone series.—See A., II, 505.

Corticosterone.—See A., II, 506.

Enolic derivatives of progesterone etc.—See A., II, 505.

Insulin. V. du Vigneaud (J. Washington Acad. Sci., 1937, **27**, 365—373).—An account of the author's work on the form in which S occurs in insulin. F. O. H.

Effect of various hormones on blood-glutathione. II. Insulin and vagotonin. E. Zunz and O. Vesselovsky (Biochem. Z., 1937, **292**, 326—331; cf. A., 1933, 321, 1087).—The contents of reduced and oxidised glutathione (I) in the erythrocytes of dogs are not changed by injection of cryst. insulin; those of reduced and total (I) are increased by intravenons injection of vagotonin into dogs with or without ligature of the adrenal vein. F. O. H.

Hypoglycæmic action of insulin–tannic acid. F. M. Chiancone (Boll. Soc. ital. Biol. sperim., 1937, **12**, 323—324).— In rabbits the hypoglycæmic action of insulin (I) (3 clinical units) is reduced in intensity but is prolonged by injection in presence of 0·6 c.c. of 6% aq. tannic acid. The effect of Zn (1 mg. of $ZnSO_4$) added to the mixture is intermediate between the above and that (increased but not prolonged hypoglycæmia) of Zn+(I) alone. F. O. H.

Clinical experience with protamine insulinate. H. F. Root, P. White, A. Marble, and E. H. Stotz (J. Amer. Med. Assoc., 1936, **106**, 180—183).—The compound is not indefinitely stable and is relatively slowly absorbed. Ch. Abs. (*p*)

Production of fibromatous growths by parathyroid injections. H. Biberstein (Arch. Dermatol. Siphilis, 1935, **173**, 253—261).—Intramuscular injection of parathyroid extracts in guinea-pigs and rabbits produced changes of a fibromatous nature. Tissue sections showed negative Kossa tests for Ca. Ch. Abs. (*p*)

Thyroid function and carbohydrate metabolism. F. Vacirca (Arch. Ist. Biochim. Ital., 1937, **9**, 225—256).—Intravenous injection of lecithin into rabbits, dogs, or guinea-pigs reduces the liver-glycogen and the hyperglycæmia due to injection of glucose or adrenaline. These effects do not occur after thyroidectomy. F. O. H.

Relations between thyroid gland, blood-sugar, and storage of glycogen. C. Schwarz [with A. Bohrn and A. Mayer] (Biochem. Z., 1937, **293**, 295—301).—In thyroidectomised dogs oral administration of large doses of glucose (I) causes an increase in the sugar content of the blood which is almost double that produced by the same doses in normal dogs, the effect being also more prolonged in the thyroidectomised dogs. In thyroidectomised (but not in normal) dogs the hyperglycæmic effect of (I) is diminished by previous administration of thyroid.

Possibly the thyroid gland directly or indirectly affects the storage of carbohydrate in the body. W. McC.

Hyperthyroidism and brain oxidations. R. A. Cohen and R. W. Gerard (J. Cell. Comp. Physiol., 223—240).—O_2 consumption is higher initially in hyperthyroid than in normal brain and is increased to a greater extent than that of normal brain by addition of glycogen, glucose, fructose, glycerophosphate, lactate, or succinate. Pyruvate, galactose, glycine, and AcCHO have the same effect in hyperthyroid as in normal brain. Hyperthyroid brain contains higher concns. of various enzyme systems than does normal brain and dehydrogenases are increased relatively > oxidases. M. A. B.

Nature of the hormone controlling Brunner's glands. H. W. Florey (Quart. J. Exp. Physiol., 1935, **25**, 329—339).—Brunner's glands in cats are controlled by secretin. Ch. Abs. (*p*)

Number of neurohormones in the control of frog melanophores. G. H. Parker and L. E. Scatterty (J. Cell. Comp. Physiol., 1937, **9**, 297—314).—Only one hormone, probably intermedin (I), appears to be involved in the control of frog melanophores. Darkening results from liberation of (I) into the blood stream; blanching is due to loss of (I) from the blood. M. A. B.

Relationship between vagotonin, callicrein, and vagotropine. B. Bruno (Boll. Soc. ital. Biol. sperim., 1937, **12**, 306—307; cf. Bartolini, A., 1936, 1293).—Vagotropine is not identical with callicrein or vagotonin. F. O. H.

Vitamin nomenclature. C. Funk (Z. Vitaminforsch., 1937, **6**, 337—339).—The premature introduction of chemical nomenclature for vitamins is deprecated. F. O. H.

Vitamin therapy in non-avitaminotic conditions. J. Charvát (Z. Vitaminforsch., 1937, **6**, 339—348).—The use of vitamin preps. in certain diseases is discussed and clinical data are given. F. O. H.

Vitamins required by chicks. T. H. Jukes (J. Nutrition, 1937, **13**, 359—387).—A review of recent work. A. G. P.

Effect of cod-liver oil on the iron and copper contents of egg yolk. S. E. Erikson and W. M. Insko, jun. (Kentucky Agric. Exp. Sta., 46th Ann. Rept., 1934, 53—55).—Feeding cod-liver oil to hens increased the yield and Cu and Fe contents of the eggs. Free grass range and sunshine with or without oil had a similar effect. Birds on grass range without cod-liver oil showed lower hæmoglobin (I) contents in the blood than did similar birds receiving oil. (I) tended to decrease when egg production was high. The Fe content of liver, spleen, and kidney of penned birds was higher when oil was given. On grass range oil-feeding produced higher Fe contents in liver but not in spleen or kidneys. Ch. Abs. (*p*)

Correlation between the international and the cod-liver oil unit of vitamin-*A*. Z. Nakamiya (Bull. Inst. Phys. Chem. Res. Japan, 1937, **16**, 1149—1158).—1 Lovibond unit = 256 international units. More consistent development of the $SbCl_3$ colour occurs after hydrolysis of the oil probably because of the removal of colour inhibitors. J. L. D.

Fœtal death, prolonged gestation, and difficult parturition in the rat as a result of vitamin-*A* deficiency. K. E. Mason (Amer. J. Anat., 1935, **57**, 303—344).—Reproductive disturbances resulting from maternal deficiencies of vitamin-*A* are examined. Ch. Abs. (*p*)

Undernutrition, starvation, and phagocytosis. E. Gellhorn and J. O. Dunn (J. Nutrition, 1937, **14**, 145—153).—The decrease in phagocytic index due to prolonged deficiency of vitamin-*A* (see following abstract) is due to lack of -*A* and not to loss of body-wt. A. G. P.

Effect of lack of vitamin-*A* in the diet on phagocytosis-promoting properties of blood-serum. E. Gellhorn and J. O. Dunn (J. Nutrition, 1937, **13**, 317—328).—Vitamin-*A* deficiency may increase or decrease the phagocytic index. Infectious processes occurring in -*A* deficiency induce greater production of antibodies in the early stages of deficiency. Subsequently the phagocytic index gradually diminishes. Addition of -*A* to the diet causes reversal of the change in the index. A. G. P.

Minimum vitamin-*A* and carotene requirement of cattle, sheep, and swine. H. R. Guilbert, R. F. Miller, and E. H. Hughes (J. Nutrition, 1937, **13**, 543—564).—The amount of -*A* which just prevents night blindness in these animals is also the physiological min. The min. carotene and -*A* requirements for all species were 25—30 and 6—8 $\times 10^{-6}$ g. per kg. body-wt., respectively. The -*A* requirement is directly related to body-wt. rather than to the energy requirement. A. G. P.

Vitamin-*A* activity of butters determined by various methods. M. E. Leuschen, B. L. Kunerth, M. M. Kramer, and W. H. Riddell (J. Nutrition, 1937, **14**, 247—259).—Data obtained by the $SbCl_3$ and spectrographic methods for vitamin-*A* and the spectrophotometric method for carotene are recorded for butters obtained at various periods of lactation. A. G. P.

Colour test for vitamin-*A*. A. E. Pacini and M. H. Taras (J. Amer. Pharm. Assoc., 1937, **26**, 721—723).—The colour tests given by various reagents with vitamin-*A* are modified by presence of Cl-containing substances (*e.g.*, $HClO_4$, $SOCl_2$). -*A* with a reagent containing PhOH, guaiacol, and $HClO_4$ in $CHCl_3$ gives a purple colour developing into a bright red which appears to be sp. for -*A* (cf. Rosenthal and Erdélyi, A., 1934, 1145). F. O. H.

Vitamin-*A* and -*D* contents of light, medium, and dark egg-yolks. B. Bisbey, S. Cover, V. Appleby, and A. Weis (Missouri Agric. Exp. Sta. Ann. Rept. [1933], Bull., 1934, No. 340, 60—61).—The -*A* content of dark yolks averages four times that of light yolks. Ch. Abs. (*p*)

(A) **Antithyrogenic action of crystalline vitamin-*B*.** (B) **Influence of hyperthyroidism on vitamin-*A* reserves of the albino rat.** B. Sure and K. S. Buchanan (J. Nutrition, 1937, **13**, 513—519, 521—524).—(A) The efficiency of vitamin-*B* in overcoming

the toxicity of thyroxine (I) depends on the source of the stable components of the -*B* complex. When these components are provided by autoclaved baker's yeast cryst. -*B* becomes an active antithyrogenic agent. (B) Diet containing 50% of dried skim milk provides sufficient of the stable components of -*B* to permit observation of the response of rats to cryst. -*B* as an antithyrogenic agent. Such a ration containing 10% of butter fat and cod-liver oil (4 drops per animal per day) does not provide sufficient -*A* to counteract the rapid catabolism produced by daily administration of 0·2 mg. of (I). A. G. P.

Vitamin-*B* complex. Presence of a third factor. R. J. Block and R. B. Hubbell (Yale J. Biol. Med., 1935, **8**, 169—174).—In rat feeding trials evidence was obtained of a third factor in the -*B* complex of rice polishings, which is adsorbed by Lloyd's reagent and is eluted by dil. NaOH but not by EtOH–HCl. Ch. Abs. (*p*)

Formation of vitamin-*B* complex in the digestive tract of the rat. N. B. Guerrant, R. A. Dutcher, and R. A. Brown (J. Nutrition, 1937, **13**, 305—315).—Presence of 10—20% of hydrogenated cottonseed oil in a -*B*-deficient diet containing sucrose does not facilitate production of -*B* in the digestive tract. Autoclaving starch for > the customary 4 hr. period does not increase the amount of supplementary substance in rat fæces. Diets which increase fæcal matter, and have low *d* and high reducing equiv., favour the production in the digestive tract of substances which are effective in supplementing a -*B*-deficient diet. A. G. P.

Action of the individual components of the vitamin-*B* complex on the volume increase of the adrenal cortex produced by physical work. J. Perjés (Pflüger's Archiv, 1936, **238**, 341—344).—Neither vitamin-B_1 nor lactoflavin (I), nor -B_1 and (I) together, prevented adrenal hypertrophy through physical work, whereas beer yeast extract autoclaved at 120° for 6 hr. had a definite inhibiting effect. M. A. B.

Effects of ultra-violet rays on vitamin-*B*. A. G. Hogan and L. R. Richardson (Missouri Agric. Exp. Sta. Ann., Rept. [1933], Bull., 1934, No. 340, 26—27).—Irradiation with a quartz–Hg arc destroys one component of the vitamin-*B* complex. Irradiation of a solution of tiki-tiki and liver extract destroyed a considerable proportion of the -*B* activity. Ch. Abs. (*p*)

Effect of vitamin-*B* and iodine on the weight, iodine content, and structure of the thyroid gland of the rat. M. D. Carpenter and G. R. Sharpless (J. Nutrition, 1937, **13**, 235—247).—Deficiency of vitamin-*B* did not affect the size, structure, or I content of the thyroid gland, but when coupled with deficiency of I (0·0038% of the diet) caused a condition simulating colloid goitre. The latter did not appear with a diet containing 0·019% of I or -*B*. Autoclaving yeast causes loss of a factor (not included in -*B*) which increases the [I] and total I content of the thyroid. A. G. P.

Alleviation of vitamin-*B* deficiency in the rat by certain natural fats and synthetic esters. W. D. Salmon and J. G. Goodman (J. Nutrition, 1937, **13**, 477—500).—Large proportions of fat added to a vitamin-*B*-deficient diet diminished the incidence of beri-beri in rats, coconut fat being notably effective. The efficiency of individual esters of fatty acids varied with the length of the C chain of the acids, max. being attained with 8 C. Glyceryl hexoate and octoate cured spastic beri-beri in rats. The apparent nutritive val. of fats in -*B*-deficient rations differed from that of rations containing -*B*. -*B* was more efficient than autoclaved yeast in retarding the appearance of beri-beri. A high intake of protein or of -B_2 was not a requisite for the action of fat in alleviating -*B* deficiency. The *n* of the fatty fraction of fat from brain and liver and the magneto-optical properties of hexoic and octoic acids from these fractions showed no differences attributable to -*B* deficiency. A. G. P.

Adsorption of vitamin-*B* by plant tissue (*Solanum melongena*, L., and *Raphanus sativus*, var. *longipannatus*, Bailey) when pickled with salt and rice bran. C. D. Miller (J. Nutrition, 1936, **13**, 687—694).—After pickling in salt and rice bran the eggplant and takuan (a prep. of *R. sativus*) showed markedly increased -*B* contents, and the tissues (leaf, fruit, or root) attained p_H 4·7—4·8, a condition favouring adsorption of -*B* from the rice bran. A. G. P.

Dynamics of blood-cholesterol during development of avitaminosis-*B* in pigeons. A. Bruck (Z. Vitaminforsch., 1937, **6**, 289—295).—The periods of latent, developing, and established avitaminosis-B_1 are associated with normal (0·032—0·050, average 0·043%), increasing, and diminishing (*i.e.*, back to normal levels) vals. of the blood-cholesterol, respectively. F. O. H.

Vitamin-*B*. I. Relationship between deficiency of vitamin-B_1 and bradycardia. G. W. Parade (Z. Vitaminforsch., 1937, **6**, 327—334).—The bradycardia occurring during avitaminosis-B_1 is due to inanition. F. O. H.

Effect of vitamin-B_1 deficiency on heat production of the rat. Le R. Voris (J. Nutrition, 1937, **14**, 199—213).—Heat production of -B_1-deficient rats was < normal over a period of 7 weeks. Supplementary feeding of -B_1 resulted in an increased proportion of the ration being metabolised, a more favourable energy balance, less energy, and a lower proportion of C to N in urine, and a greater % retention (as body gain) of the digested N. A. G. P.

Sparing action of lactoflavin on vitamin-B_1. L. N. Ellis and A. Zmachinsky (Science, 1937, **86**, 245—246).—With young rats, the growth and length of survival during the period of feeding on a vitamin-B_1-deficient diet was directly dependent on the lactoflavin (I) content of the maternal diet, showing that (I) spared the -B_1 reserves of the body. L. S. T.

Vitamin-B_1 craving in rats. C. P. Richter, L. E. Holt, jun., and B. Barelare, jun. (Science, 1937, **86**, 354—355).—Rats show an excessive appetite for vitamin-*B* either as B_1 (betaxin or betalin) or as riboflavin. L. S. T.

Effect of vitamin-B_1 on the activity of acetylcholine. B. Minz and R. Agid (Compt. rend., 1937, **205**, 576—577).—Vitamin-B_1 in very low concn. sensitises eserinised leech muscle to the action of acetylcholine (I) (1 in 10^8). Higher concns. reduce the sensitivity of the prep. -B_1 does not afford (I) additional protection against hydrolysis and may be identical with the sensitising substance found previously (Arch. Internat. Physiol., 1936, **42**, 281) in the vagus. J. L. D.

Chemical nature of vitamin-B_1. G. Narasimhamurthy (Indian J. Med. Res., 1936, **24**, 221—231).—Electrophoresis and micro-cataphoresis experiments show that the isoelectric point of vitamin-B_1 lies between p_H 9·0 and 10·0, nearer to the former. On the acid side -B_1 migrates consistently to the cathode, but on the alkaline side some irregularity occurs. R. N. C.

Synthesis of the antineuritic vitamin.—See A., II, 525.

Use of yeast or other fungi for vitamin-B_1 tests. R. J. Williams (Science, 1937, **86**, 349—350).—Such use is of questionable val. L. S. T.

Chemical determination of vitamin-B_1 in foodstuffs and biological material by means of the thiochrome reaction. M. A. Pyke (Biochem. J., 1937, **31**, 1958—1963).—The application of Jansen's method (A., 1937, III, 77) is described. F. O. H.

Determination of vitamin-B_1 in male urine. W. Karrer (Helv. Chim. Acta, 1937, **20**, 1147—1155).—Vitamin-B_1 in urine is adsorbed on C and the adsorbate treated by the method of Karrer and Kubli (A., 1937, III, 281). If the natural fluorescence of urine is taken into account, 3—5 $\times$ 10^{-6} g. of -B_1 per 100 c.c. of urine can be determined with sufficient accuracy. In one instance with normal diet, 97 $\times$ 10^{-6} g. of -B_1 occurred in the urine in 24 hr. After oral administration of larger amounts of -B_1, only about 3—5% is found in the urine; the greater is the dose, the smaller is the % excretion. A transitory retention of -B_1 in the body is established. Digestive enzymes do not decompose -B_1. H. W.

Determination of vitamin-B_1 and -B_2 in human urine by the rat-growth method. O. M. Helmer (J. Nutrition, 1937, **13**, 279—286).—With excess of vitamin-B_1 in the diet (Cowgill's formula), -B_1 is detectable in urine. In normal urines the amount of -B_2 is $>$ that of -B_1. A. G. P.

Effect of yeast on liver-glycogen of white rats during hyperthyroidism. V. A. Drill (J. Nutrition, 1937, **14**, 355—364).—The liver-glycogen of rats receiving low levels of vitamin-B_1 and -B_2 (yeast) diminished after subcutaneous injection of thyroxine, but continued at normal levels if the diet included adequate -B_1 and -B_2 supplies. A. G. P.

Vitamin-B_1 and -B_2 values of peas and Lima beans under various conditions. M. S. Rose and E. H. F. Phipard (J. Nutrition, 1937, **14**, 55—67).—The vitamin-B_1 content of peas is not affected by freezing but decreases by 26% on cooking. Maturation of peas and Lima beans involves a loss of 50% of their -B_1 contents. Peas germinated and grown 14 days in sand lost 50% of their -B_1, but synthesised -B_2. The vitamin content of Lima beans varied with the locality of growth. Freezing caused no loss of -B_2 in either seed. A. G. P.

Vitamin studies. R. Reder (Oklahoma Agric. Exp. Sta. Rept. [1932—4], 1934, 184—187).—In rats deprived of vitamin-B_1 and -B_2 carbohydrate absorption proceeded normally. -B promotes growth by increasing the plane of nutrition by stimulating the appetite. The sp. growth effect of -B is not demonstrable in adult rats. Ch. Abs. (*p*)

Vitamin-B_2 content of some foods. H. Levine and R. R. Remington (J. Nutrition, 1937, **13**, 525—542).—Cottonseed meal, soya beans, dried whole milk, and dried brewer's yeast were good sources of vitamin-B_2. The -B_2 potency of milk from pellagrous was similar to that from other localities. Extraction of cottonseed meal with EtOH removes 50% of the -B_2 content. No -B_2 was destroyed in the extraction process. Pressure-cooking (15 lb., 30 min.) did not destroy the -B_2 of cottonseed meal or soya beans. A. G. P.

Identity of flavin with the cataract-preventive factor. P. L. Day, W. J. Darby, and W. C. Langston (J. Nutrition, 1937, **13**, 389—399).—Young rats receiving a vitamin-B-free diet supplemented with rice polishings extract developed cataract. Addition of lactoflavin (I) to the diet prevented this. (I) failed to prevent "rat pellagra." A. G. P.

Biological assay of lactoflavin with chicks. T. H. Jukes (J. Nutrition, 1937, **14**, 223—233).—The technique is described, and data so obtained for numerous foodstuffs are recorded. A. G. P.

Lactoflavin. H. Vetter (Ergebn. Physiol., 1936, **38**, 855—876).—A review. W. McC.

Effect of extracts of rice polishings and beef liver on pellagra-like symptoms of rats due to a high-sucrose diet. U. Tange (Bull. Inst. Phys. Chem. Res. Japan, 1937, **16**, 1058—1070).—Rats fed on a diet in which sucrose or dextrin is the source of carbohydrate develop dermatitis (more easily in the former case) which is cured by an adsorbate [György's vitamin-B_6 (?)] on acid clay at p_H 2·5 of extracts of rice polishings. Growth is poor, but it is increased when an acid clay adsorbate of ox liver extract or a conc. prep. of this substance is fed in addition. J. L. D.

Dietary production of the syndrome of deficiency in vitamin-B_6. W. Halliday and H. M. Evans (J. Nutrition, 1937, **13**, 657—667).—A high-sucrose, low-fat diet containing casein extracted with hot 95% EtOH and cold 60% EtOH consistently induces the syndrome of vitamin-B_6 deficiency. Cystine removed from casein by EtOH treatment is not a factor in -B_6 deficiency. A. G. P.

Relation of vitamin-B and -C in regard to beri-beri. J. L. Rosedale and L. P. Chong (Trans. 9th Congr. Far East Assoc. Trop. Med., 1934, **1**, 337—344).—Confirmation is obtained that vitamin-B_1 consists of an antineuritic factor and a second concerned in the maintenance of good general condition. Vitamin-C from pineapple juice can

probably replace the antiberi-beri factor in -B_1. It is postulated that -*C* and -B_1 form a "H_2O-sol. vitamin complex" which is essential for normal metabolism, and breaks down into -*C* and the components of -B_1 only under certain conditions.
CH. ABS. (*p*)

Vitamin-*B* and -*C* content of marine algæ. E. R. NORRIS, M. K. SIMEON, and H. B. WILLIAMS (J. Nutrition, 1937, **13**, 425—433).—The vitamin-*B* content of a no. of algæ examined compared favourably with that of many fruits and vegetables. Species of *Porphyra* were particularly rich in -*B* and -*C*. Algæ growing in the littoral zone or on the surface tend to have higher -*C* contents than those dredged from the sea bottom (5—10 fathoms). A. G. P.

Effect of vitamin-*C* on the action of insulin in the organism. E. LIPPMANN and T. SANGUINETI (Boll. Soc. ital. Biol. sperim., 1937, **12**, 317—319).—Data for the reducing power of the urine of guinea-pigs following administration of glucose with and without ascorbic acid (I) do not indicate any interference by (I) of *in-vivo* insulin action similar to that occurring *in vitro* (Freudenberg and Wegmann, A., 1935, 789). F. O. H.

Saturation of a scurvy patient with small doses of ascorbic acid. Daily human requirement. P. SCHULTZER (Biochem. J., 1937, **31**, 1934—1938).—On a vitamin-*C*-free diet the daily excretion of ascorbic acid (I) was 11 mg. Saturation was reached in 23 days with daily intravenous injection of 40 mg. of (I) when 26 mg. per day were excreted, the daily human requirement probably being <40 mg.
H. G. R.

Relation of ascorbic acid ingestion to mineral metabolism in children. A. L. DANIELS and G. J. EVERSON [with O. E. WRIGHT, M. F. DEARDORFF, and F. I. SCOULAR] (J. Nutrition, 1937, **14**, 317—328).—Ingestion of ascorbic acid (I) at levels of 25—12·5 mg. per kg. had no effect on retention of Ca, P, and Mg. Ca and P retentions were unrelated to the Ca and (I) contents of the diet when > the physiological min. of either was given. The N retention of children receiving < the min. (I) requirement was < when adequate (I) was given. Ingestion of (I) > the physiological requirement produced no further increase in N retention. Orange juice (60 and 100 c.c. daily) had no influence on Ca, P, Mg, or N retentions.
A. G. P.

Urinary elimination of certain substances following administration of ascorbic acid. F. M. CHIANCONE (Arch. Farm. sperim., 1937, **64**, 160—163).—Ingestion of ascorbic acid by men decreases the excretion of neutral S, probably due to increased oxidation within the organism. F. O. H.

Action of vitamin-*C* and its organo-metallic compounds on development and fermenting power of the *Vibrio septique*. F. ARLOING, A. MOREL, A. JOSSERAND, L. THÉVENOT, and R. CAILLE (Compt. rend. Soc. Biol., 1937, **125**, 347—349).—The fermenting power is increased by ascorbic acid and to a smaller extent by dehydroascorbic acid, metallic derivatives, and oxidation products having an oxidation-reduction function. H. G. R.

Effect of diptheria toxin on vitamin-*C in vitro*. C. C. TORRANCE (J. Biol. Chem., 1937, **121**, 31—36).—When the toxin and lemon juice are mixed *in vitro*, the ascorbic acid (I) has no effect on the toxin within the p_H range of mammalian muscle; although the (I) content decreases, the effect of different toxins does not vary in proportion to their toxicity in guinea-pigs. Heated culture filtrates have the same action as unheated. The destruction of the (I) content by toxic filtrates *in vitro* is reversible. P. W. C.

Effect of administration of acid and alkaline salts on the ascorbic acid contents of guinea-pig tissues. E. E. HAWLEY, R. G. DAGGS, and D. J. STEPHENS (J. Nutrition, 1937, **14**, 1—8).—Administration of $NaHCO_3$ in amounts sufficient to cause high alkalinity in urine increases the ascorbic acid contents in the adrenals and liver of guinea-pigs.
A. G. P.

Ascorbic acid in aqueous humour. J. FRANTA (Compt. rend. Soc. Biol., 1937, **126**, 110—113).—Ascorbic acid in aq. humour is not formed solely by the crystallin. H. G. R.

Migration of ascorbic acid (vitamin-*C*) in an electrical field. S. RANGANATHAN and G. SANKARAN (Indian J. Med. Res., 1936, **24**, 213—220).—Ascorbic acid (I) migrates to the positive pole at all p_H levels between 1·0 and 13·0; phenolphthalein migrates only at p_H >8·5, and fructose does not migrate at all. (I) must hence contain a free CO_2H, but no lactone structure or acidogenic ·CH(OH)·CO· group. The rate of destruction of (I) in solution increases with p_H.
R. N. C.

Preparation of ascorbic acid. A. A. SCHMIDT and K. Z. TOULTCHINSKAIA (Bull. Soc. Chim. biol., 1937, **19**, 1200—1208).—Aq. extracts of 14·8 kg. of sweet briar berries are conc. in a vac. and treated successively with EtOH and Et_2O, impurities filtered off, and the filtrate is evaporated almost to dryness. The product is again treated with EtOH–Et_2O and finally cryst. from EtOH–light petroleum (yield 52·21 g.). P. W. C.

Infra-red absorption spectrum of vitamin-*C*.—See A., I, 495.

Quinone reactions.—See A., II, 530.

Relation of vitamin-*D* to skin respiration. A. K. PRESNELL (J. Biol. Chem., 1937, **121**, 5—8).—The O_2 uptake of the skins of rachitic rats is only 60—70% of that of the skins of rats of the same age on the same diet with the exception that a small amount of vitamin-*D* sufficient to prevent rickets had been added. When -*D* was added to the diet of the rachitic rats, recovery from rickets was accompanied by increase of skin respiration to normal vals.
P. W. C.

Multiple nature of the vitamin-*D* of fish oils. C. E. BILLS, O. N. MASSENGALE, M. IMBODEN, and H. HALL (J. Nutrition, 1937, **13**, 435—452).—Differences in the vitamin-*D* potency per rat unit of fish-liver oils are attributed to the existence of two or more forms of -*D*. The efficiency of irradiated ergosterol was < that of many fish oils. The efficiency of irradiated 7-dehydrocholesterol approximated to that of cod-liver oil or irradiated cholesterol but was

< that of white sea bass-liver oil. Oils from related species differed widely in -*D* efficiency. A. G. P.

Selectively irradiated ergosterol. T. H. Rider, G. Sperti, G. P. Good, and H. G. Cassidy (J. Amer. Med. Assoc., 1936, **106**, 452—456).—Selective long-wave ultra-violet irradiation activates ergosterol (I) without formation of undesirable decomp. products. A vegetable oil solution of (I) containing 10,000 units per g. can be prepared. Ch. Abs. (*p*)

Antirachitic vitamin of the liver-oil of the blue-fin tunny. H. Brockmann and A. Busse (Z. physiol. Chem., 1937, **249**, 176—180; cf. A., 1936, 1161).—The oil contains vitamin-D_3, which is isolated by a modification of the method previously described. W. McC.

Relation of vitamin-*E* to sterility in dairy cows. C. Y. Cannon, D. L. Espe, and B. H. Thomas (Iowa Agric. Expt. Sta. Rept. Agric. Res., 1934, 55).—Destruction of vitamin-*E* in the ration for milch goats did not affect the fertility of the goats in the first gestation period. Ch. Abs. (*p*)

Effect of vitamin-*E* deficiency on growth. G. A. Emerson and H. M. Evans (J. Nutrition, 1937, **14**, 169—178).—Wheat-germ oil added to vitamin-*E*-deficient diets prevented sterility and increased growth rates of rats. The growth-providing factor occurs in the unsaponifiable fraction of the oil. A. G. P.

Vitamin-*E* and growth. H. S. Olcott and H. A. Mattill (J. Nutrition, 1937, **14**, 305—315).—A synthetic vitamin-*E*-free diet containing extracted casein and yeast, sucrose, Et esters of hydrogenated cottonseed oil fatty acids, carotene, calciferol, and a salt mixture produced similar adolescent growth of rats as did the same diet supplemented with -*E* concentrates. From 2 months onwards the -*E*-supplemented animals showed relatively the greater growth. Early normal growth is not dependent on -*E*. A. G. P.

Vitamin-*E* (tocopherol). J. C. Drummond and A. A. Hoover (Biochem. J., 1937, **31**, 1852—1860).—A two-stage adsorption process after gross removal of sterols gave higher yields of active material than could be obtained by partition between pentane and 92% MeOH followed by a single adsorption. By freezing the MeOH solution of the fractions or from the digitonide ppt. there was obtained a sterol, m.p. 156°, separable into two *fractions*, $C_{29}H_{46}O$, m.p. 141—142° (3 : 5-dinitrobenzoate, m.p. 202—203°, $[\alpha]_D^{20°}$ −7·2° in $CHCl_3$), and $C_{29}H_{48(44)}O$, m.p. 156° (3 : 5-dinitrobenzoate, m.p. 180—182°, $[\alpha]_D^{20°}$ +15·7° in $CHCl_3$). A further sterol (probably α-tritisterol) was also isolated from the digitonide ppt. Attempts to prepare allophanates from the original fractions resulted only in the isolation of β-tocopherol allophanate, m.p. 138°, the regenerated tocopherol from which conformed to the formula $C_{29}H_{50}O_2$. The surface spreading properties tend to a limiting area of 65 sq. A., or of 80 sq. A. following oxidation by neutral 0·01N-$KMnO_4$, and are compatible with a sterol structure. P. G. M.

Vitamin-*E*. G. J. Martin (J. Nutrition, 1937, **13**, 679—685).—An attempt to separate vitamin-*E* into two fractions is described. A growth-stimulating factor is demonstrated in concentrates previously considered to contain only the anti-sterility factor. A. G. P.

Cumotocopherol, a new factor of the vitamin-*E* group. W. John (Z. physiol. Chem., 1937, **250**, 11—24; cf. Evans *et al.*, A., 1936, 531; Fernholz, A., 1937, II, 339).—In the analysis of the unsaponifiable matter of wheat-germ oil, the mother-liquor from which α-tocopheryl allophanate separates yields the *allophanate* (I), m.p. 146°, $[\alpha]_D^{18}$ + 6·7° in $CHCl_3$, of *cumotocopherol* (II), $C_{28}H_{48}O_2$, and a *hydrocarbon*, probably $C_{18}H_{38}$, m.p. 63°. (II) at 350—370° yields 2 : 3 : 5-trimethylquinol (III). Probably (II) and α-tocopherol are the mono-ethers of $C_{13}H_{37}$·OH and (III) and 2 : 3 : 5 : 6-tetramethylquinol respectively. (I) and (II) exhibit max. absorption of ultra-violet light at 280 and 295 mμ., respectively. (II) exhibits anti-sterility action on rats in doses of 8 mg. but does not restore normal lactation in the females. W. McC.

Biological assay of vitamin-*E*. Application to wheat germ and wheat-germ oil. L. S. Palmer (Ind. Eng. Chem. [Anal.], 1937, **9**, 427—429).—Assay of vitamin-*E* by oral administration to rats is described. Results are only approx. quant.; methods of expressing them are discussed. Expression of the oil from wheat germ removes the vitamin without loss. Wheat germ is stable for 1 year in an evacuated tin whilst the oil is stable for several months in sealed containers at <0°. R. S. C.

Oats and lettuce carry needed factor for lactation. C. R. Meyer (Illinois Agric. Exp. Sta. 47th Ann. Rept. [1933—4], 1935, 248—249).—Successful lactation in rats receiving a purified diet containing all known essentials was obtained by supplementary feeding of lettuce, oats, or Et_2O-extract of oats. The lactation factor was not supplied by cod-liver or wheat-germ oils or by yeast. Ch. Abs. (*p*)

Growth-promoting factor associated with summer milk. G. O. Kohler, C. A. Elvehjem, and E. B. Hart (J. Nutrition, 1937, **14**, 131—144).—Growth of rats receiving mineralised winter milk was stimulated by supplements of grass or grass juice, rice bran, and liver extract, the effect being accompanied by an increased consumption of the milk. The active factor is not vitamin-*A*, -*D*, -*C*, -B_1, -B_2, -B_4, -B_6, flavin, choline, "goat-milk factor," or "EtOH–Et_2O ppt. factor." A. G. P.

New essential dietary factor in mammalian liver. W. Halliday and H. M. Evans (J. Nutrition, 1937, **14**, 45—54).—The conclusions of Elvehjem (A., 1936, 1568) are examined. The EtOH–Et_2O pptn. procedure carries down vitamin-B_6 leaving flavin in the supernatant liquid. A new dietary factor other than -B_1, -B_2, -B_4, and -B_6 could not be demonstrated. A. G. P.

Antihæmorrhagic vitamin. H. J. Almquist (J. Biol. Chem., 1937, **120**, 635—640; cf. A., 1937, III, 365).—An improved process for the isolation of the vitamin (I) is described. The process involves mol. distillation and crystallisation from MeOH at low temp. (I) is a colourless, cryst. substance of low m.p. containing < one C_6H_6 ring. A. L.

Assay procedure for vitamin-*K* (antihæmorrhagic vitamin). H. J. Almquist and E. L. R. Stokstad (J. Nutrition, 1937, **14**, 235—240).—Determination of hæmoglobin in the assay of vitamin-*K* (method described) is unnecessary since avitaminosis-*K* is not a primary cause of anæmia in chicks. -*K* occurs in soya-bean oil. A. G. P.

Influence of diet on skin abnormalities in rats. H. von Euler and M. Malmberg (Z. Vitaminforsch., 1937, **6**, 325—327).—The symptoms of avitaminosis-*H* due to ovalbumin (I) are not produced, but are alleviated, by replacement of (I) by caseinogen, serum-albumin, or Witte's peptone (cf. A., 1937, III, 439). F. O. H.

Vitamin-*H*. I. Abelin (Z. Vitaminforsch., 1937, **6**, 334—336).—Loss of hair and skin lesions in rats fed only on rusks or coarse wheat-meal biscuits are cured by administration of products (*e.g.*, kidney, liver) rich in vitamin-*H* or, more slowly and less effectively, by that of cystine or dried thyroid substance. F. O. H.

Gizzard factor of the chick. H. J. Almquist and E. L. R. Stokstad (J. Nutrition, 1937, **13**, 339—350).—Gizzard erosion results from deficiency of a fat-sol. factor which is not identical with any known vitamin. The factor is readily destroyed by heat and by alcoholic KOH and is adsorbed from C_6H_{14} solution by activated MgO. Dried greens and wheat bran are good sources of this factor, which has no apparent influence on the growth of chicks. A. G. P.

Sources and nature of the chick gizzard factor. H. J. Almquist (J. Nutrition, 1937, **14**, 241—245).—The gizzard factor is unstable to heat and to EtOH. It is present in the gizzard lining but is unrelated to growth rate. A. G. P.

Effect of administration of ascorbic acid and vitamin-*P* on the content of erythrocytes capable of being stained in guinea-pigs' blood. H. von Euler and M. Malmberg (Z. physiol. Chem., 1937, **249**, 85—92).—In healthy guinea-pigs administration of large doses of vitamin-*C* or -*P* scarcely affects the proportion of erythrocytes capable of being stained in the blood. In scorbutic guinea-pigs the administration of -*C* or -*P* causes very rapid and great (up to 30%) increase of short duration in the proportion. Combined administration of -*C* and -*P* has a similar but more prolonged effect. W. McC.

Vitamin-*P*. S. S. Zilva (Nature, 1937, **140**, 588).—No vitamin-*P* activity occurred with daily doses of either "citrin," hesperidin (I), or (I) + eriodictyol administered to guinea-pigs on a scorbutic diet. With sub-optimal preventive doses of ascorbic acid, a biological response similar to that observed by Szent-Györgyi *et al.* was obtained. The bearing of these results on Bentsáth and Szent-Györgyi's latest view (A., 1937, III, 441) concerning the action of -*P* is discussed. L. S. T.

[Essential dietary] factor *W*. D. V. Frost and C. A. Elvehjem (J. Biol. Chem., 1937, **121**, 255—273; cf. A., 1936, 1568).—Rats on an otherwise adequate diet grow normally only when sufficient quantities of flavin and of factor *W* ("factor pptd. by EtOH–Et_2O") are added. The material in the filtrate obtained from liver extract after pptn. of the pernicious anæmia factor yields *W* when extracted with aq. $COMe_2$ containing HCl, the $COMe_2$ being subsequently removed and the aq. residue purified by filtration and treatment with fuller's earth. *W* is destroyed by treatment with C but is stable towards cold acid and alkali and is not destroyed by boiling for short periods at p_H 1·0 and 9·0. It is resolved into two components by treatment in H_2O with $Hg(OAc)_2$ or $Ba(OAc)_2$, both the ppt. and the filtrate containing growth-promoting material. Optimal growth is obtained only when the components are combined. Adenine nucleotide (I), added to the diet in place of *W*, has an immediate but not continuous growth-promoting effect and nicotinamide (II), used in the same way, promotes growth after approx. two weeks. Immediate and continuous growth follows when (I) + (II) replace *W*. *W* has strong reducing powers and is probably related to (I) and (II). W. McC.

Serial cultures of vegetable tissues grown on synthetic media. P. Nobécourt (Compt. rend., 1937, **205**, 521—523).—Sections of carrot, kept under suitable conditions for several weeks, show proliferation of tissue cells. A method for growing these new cells, free from the parent tissue, through three generations is described. J. L. D.

Cultures of cambial tissue. R. Gautheret (Compt. rend., 1937, **205**, 572—573).—Hetero-auxin in concns. >1 in 10^{10} stimulates the growth of the isolated cambium of *Salix caprœa*, whereas with concns. of 1 in 10^4 or 10^5 growth is impeded. Cysteine hydrochloride acts similarly but is less toxic. Vitamin-B_1 is very active as a growth accelerator; the newly formed cells, free from the original tissue, reproduce prolifically. J. L. D.

Membrane tension and orientation of structure in the plant cell wall. E. S. Castle (J. Cell. Comp. Physiol., 1937, **10**, 113—121).—The micellar orientation in the growing plant cell wall is explained on the basis of differences in tension along different directions in the wall. M. A. B.

Influence of weak electric currents on the growth of the coleoptile. N. G. Cholodny and E. C. Sankewitsch (Plant Physiol., 1937, **12**, 385—408).—Passage of a current (10^{-7}—10^{-6} amp.) from base to apex caused a brief acceleration followed by a decline in the growth rate of coleoptiles. Currents in the reverse direction cause a diminution in growth rate which is maintained after the current ceases. The current causes translocation of the growth hormone, not directly as an electrolyte, but indirectly through the protoplasmic system. Theories of Went and of Kögl on the mechanism of action of the hormone are discussed. A. G. P.

Staining of plastids in fixed plant cells by acid fuchsin and toluidine-blue, in relation to p_H. H. Drawert (Flora, 1937, **31**, 341—354).—Absorption of dyes by plastids and by gelatin (I) varies with p_H. In gelatin diffusion of acid dye diminishes and absorption increases with rising p_H. The reverse is true of basic dyes. The uptake of dye is unrelated

to the degree of swelling of (I) at any p_H examined. Electrostatic adsorption is the principal factor in the uptake of dyes. The isoelectric point of the adsorbent and the [H·] of the dyes are of primary importance in vital staining and in the staining of fixed plant tissues. A. G. P.

Exchange of electrolytes between roots and acid solutions. R. BEALL (Plant Physiol., 1937, **12**, 455—470).—Certain org. and inorg. acids were absorbed from very dil. solutions by roots of *Lupinus albus*, the rate of intake increasing (within limits) with concn., and at any given concn. with the degree of dissociation of the acid. Subsequent injury to plants was due to H· (absorption of which was rapid), except in the case of $EtCO_2H$ in which the undissociated mol. was largely concerned. Absorption of acids was frequently followed by exosmosis from roots, thus indicating increased permeability of cell membrane or rapid destruction of cell contents. A. G. P.

Mechanism of bursting of fruits of *Impatiens balsamina*, Linn. P. PARIJA and P. MALLIK (J. Indian Bot. Soc., 1936, **15**, 59—61).—The phenomenon is explained by local and seasonal differences in cell sap concn. CH. ABS. (*p*)

Reduction of silver nitrate by chromatophores of zygnema and other green algæ. E. A. BOITSCHENKO (Bull. soc. nat. Moscou, Sect. biol., 1935, **44**, 5—14).—Reduction of $AgNO_3$ by plastids occurs only in live tissue. The lipin phase (containing chlorophyll) shows the greatest activity in this respect. CH. ABS. (*p*)

Absorption and transpiration [in plants]. II. Cut shoots treated with different concentrations of sodium chloride, potassium nitrate, and formalin solutions. T. EKAMBARAM and I. M. RAO (J. Indian Bot. Soc., 1935, **14**, 183—236).—All three substances decreased the rate of absorption as the solutions passed up the stems of *Barleria cristata*, the effect being intensified as the solutions entered the leaves. After entry absorption was further diminished by NaCl, diminished but to a small extent by KNO_3, and increased, in some cases to initial rates, by CH_2O. Transpiration was affected only when the solutions entered the leaves, NaCl causing a steady diminution, KNO_3 effecting an initial decrease followed by a slow increase, and CH_2O causing a steady increase. Relations between absorption and transpiration are discussed. CH. ABS. (*p*)

Accumulation of salts in tips of avocado leaves in relation to tip-burn. A. R. C. HAAS (Calif. Avocado Assoc., Year Book, 1935, 105).—Burning occurs when leaves accumulate excessive amounts of Cl. CH. ABS. (*p*)

Ash analysis in the investigation of living functions of plants. K. ARENS (Landw. Jahrb., 1936, **82**, 453—463).—The washing of mineral matter from leaves by rain and the exudation of nutrients from roots of maturing plants are discussed in relation to the val. of ash analyses in the examination of nutritional problems in plants. A. G. P.

Effect of certain nutrient deficiencies on stomatal behaviour. M. C. DESAI (Plant Physiol., 1937, **12**, 253—283).—Deficiency of N, P, or K caused sub-normal stomatal activity, less response to environmental changes, and a tendency towards a less uniform distribution of stomata over the leaf although the average no. of stomata per unit leaf area remained unchanged. Excess of K slightly retarded stomatal movement. Diminution of stomatal activity is associated with increased H_2O requirement and a decline in size and yield of the plants. A. G. P.

Production of citrus mottle-leaf in controlled nutrient cultures. H. D. CHAPMAN, A. P. VANSELOW, and G. F. LIEBIG, jun. (J. Agric. Res., 1937, **55**, 365—379).—Mottling was produced in rooted orange cuttings by omission of Zn from culture solutions. The extent of mottling was greater in a high than in low light intensity and was increased by raising the proportion of PO_4''' supplied. After frequent applications of small amounts of Zn mottled leaves slowly became normal. A. G. P.

Relationships between the calcium and oxalate contents of foliage of certain forest trees. R. F. CHANDLER, jun. (J. Agric. Res., 1937, **55**, 393—396).—The total C_2O_4'' in various species of forest tree leaves is directly correlated with the total $Ca^{··}$ content and in no case is > the equiv. of total $Ca^{··}$. Except in two species C_2O_4'' occurred as CaC_2O_4. C_2O_4''-free leaves may have high $Ca^{··}$ contents. A. G. P.

Physiology of hard winter wheat plants. E. C. MILLER (Kansas Agric. Exp. Sta. Ann. Rept. [1932—4], 1934, 54—55).—Approx. 57% of the N in the mature heads was absorbed from soil between heading and maturity. At heading 75% of the total P of the plant was H_2O-sol. Although subsequent intake of P until maturity was very small the H_2O-sol. P diminished to 50% of the total. The K content of the entire plant decreased by approx. 25% in the final 3 weeks of maturation. Approx. 45% of the carbohydrate of mature heads was derived from reserves in stems and leaves, the remainder being photosynthesised and translocated in leaves during maturation. CH. ABS. (*p*)

Separation of crystals in the cell sap of Desmidiaceæ. K. ONDRACEK (Planta, 1936, **36**, 222—225).—The crystals are of $CaSO_4$ which acts as a reserve accumulation. A. G. P.

Physiology of saprophytic algæ and flagellates. I. *Chlorogonium* and *Hyalogonium*. II. *Polytoma* and *Polytomella*. E. G. PRINGSHEIM (Planta, 1937, **26**, 631—664, 665—691).—The utilisation of various sources of N and C by these organisms is examined (cf. A., 1937, III, 99). A. G. P.

Review of recent work on nitrogen metabolism of plants. H. S. MCKEE (New Phytol., 1937, **36**, 33—56). A. G. P.

Excretion of nitrogen by leguminous plants. A. I. VIRTANEN (Nature, 1937, **140**, 683).—A reply to criticism (cf. B., 1937, 1103). N excretion has been obtained in innumerable experiments under both natural and artificial conditions. No distinct excretion is obtained when a non-absorptive medium is used, and previous failures (*loc. cit.*) may be due to the use of coarse quartz sand. Other factors such as

bacterial strain, amount of nodules, host plant, the medium and its NO_3' content affect N excretion. L. S. T.

Excretion of nitrogen by leguminous plants. G. Bond (Nature, 1937, **140**, 683—684).—Negative results with inoculated soya beans and with broad beans growing in sand are reported (cf. A, 1937, III, 284). With *Pisum sativum*, L., var. "*Gradus*," a small excretion of N has been observed. L. S. T.

Losses of nitrogen from green plants. W. H. Pearsall and M. C. Billimoria (Biochem. J., 1937, **31**, 1743—1750).—In cultures of *Chlorella vulgaris* with $NaNO_3$ in the medium as the source of N, large losses of N occur in the dark. With $NaNO_3$ or with NH_4NO_3 in the light, the loss of N is relatively small. With leaves of *Narcissus pseudonarcissus* floating in a glucose–NO_3' medium, relatively large losses of N occur both in the light and in the dark. It is suggested that NO_2' formed by reduction of NO_3' reacts with the NH_2 groups of NH_2-acids (cf. A., 1936, 1569). W. O. K.

Chemical changes of fruits ripened in presence of ethylene. E. Hansen (Science, 1937, **86**, 272).—Evidence that C_2H_4 affects certain phases of the metabolism as well as the chemical composition of the fruit is illustrated by experiments on pears. After starch hydrolysis in the fruit is completed there is a short period during which softening of the fruit is markedly accelerated by C_2H_4; this increased rate of softening is due to an acceleration of the pectic changes in the cell walls. C_2H_4 accelerates the rate of protopectin hydrolysis in gooseberries, peaches, and the Ponderosa lemon. L. S. T.

Use of glucose by excised tomato roots. W. J. Robbins and M. A. Bartley (Science, 1937, **86**, 290—291).—Excised tomato root tips are able to assimilate glucose. Neither the variety of tomato nor the method of sterilisation of the media is responsible for this divergence of results. L. S. T.

Effects of individual environmental factors on the chemical constituents of plants. I. Glucoside of flax. N. M. Ferguson (J. Amer. Pharm. Assoc., 1937, **26**, 797—804).—The glucoside (I) content of flax is increased (as compared with flax grown under the respective opposite condition) by high H_2O content of the soil, complete exposure to daylight, and exposure to ultra-violet light during the day. The (I) of flax disappears after approx. 48 hr. in the dark, whilst the rate of decomp. of (I) in irradiated flax differs from that in non-irradiated flax. F. O. H.

Carbohydrate accumulation in relation to vegetative propagation of the Litchi. W. W. Jones and J. H. Beaumont (Science, 1937, **86**, 313).—Food reserves are important in vegetative propagation by grafting. In girdled branches of Litchi there is little change in N and sugars compared with non-girdled, but there is a 28-fold increase in starch. L. S. T.

Action of amylases in relation to the structure of starch and its metabolism in the plant. I. Chemical constitution of starch. II. Starch degradation by amylases. III. Amylase system of barley and malt. C. S. Hanes (New Phytol., 1937, **36**, 101—141).—A review. A. G. P.

Urease distribution in plants: general methods. S. Granick (Plant Physiol., 1937, **12**, 471—486).—Methods of determining urease are discussed from the viewpoint that in plant tissues the enzyme exists in various states of aggregation. Two methods, (i) histological, and based on the increased alkalinity of cells as urea is hydrolysed, and (ii) chemical, depending on direct determination of NH_3 formed, are described. The influence of various experimental conditions is examined. A. G. P.

Changes in chloroplast pigments in leaves during senescence. B. N. Singh and N. K. A. Rao (Nature, 1937, **140**, 728).—The data recorded for leaves of *Bassia latifolia* show that during different stages of the yellowing of a leaf there is a rise in the carotenoids (I) as chlorophyll decreases. The increase in carotene is > that in xanthophyll. At shedding of the leaf, (I) practically disappear. L. S. T.

Kinetics of cell respiration. IV. Oxidation–reduction potentials of *Chlorella* suspensions in light and in darkness. P. S. Tang and C. Y. Lin (J. Cell. Comp. Physiol., 1936, **9**, 149—163; cf. A., 1937, III, 222).—Suspensions of *Chlorella* showed different redox potentials in light and in darkness, the former val. being more positive, sometimes by > 20 mv. p_H is the same in light as in darkness except for a small, temporary change in the first 2 min. after the light is turned on or off. M. A. B.

Respiration of bananas in presence of ethylene. R. Gane (New Phytol., 1937, **36**, 170—178).—C_2H_4 is a normal metabolic product of bananas during the climacteric, when it acts as an autocatalyst. C_2H_4 can be removed from air by O_3 which, together with H_2O_2, I, and vaseline, retards the normal ripening of the fruit. C_2H_4 increases the respiration of bananas in the pre- but not in the post-climacteric stage. Acceleration of ripening by C_2H_4 is similar to that induced by volatile products eliminated by ripe fruit. A. G. P.

Relation between respiration and fermentation in yeast and the higher plants. J. S. Turner (New Phytol., 1937, **36**, 142—167).—A crit. review. A. G. P.

Theory of assimilation. I. Theory of assimilation unit. II. Franck and Herzfeld's assimilation theory. K. Wohl (Z. physikal. Chem., 1937, B, **37**, 105—121, 122—147; cf. A., 1932, 548).—I. The mathematical development of the theory (A., 1936, 392) that approx. 2500 chlorophyll mols. transfer the energy of light quanta absorbed by them to a single CO_2 mol. is presented for both continuous and intermittent illumination. The experimental data support the view that between the absorption of successive quanta by the chlorophyll–H_2CO_3 complex to form, by the absorption of four quanta, a product capable of yielding O_2 and CH_2O, no dark reactions intervene.

II. Evidence is detailed to show that Franck and Herzfeld's theory of assimilation (A., 1937, I, 319) is untenable. R. C.

Variations in the daily course of assimilation intensity of leaves of *Sinapis alba* in relation to internal factors. A. KJÄR (Planta, 1937, **26**, 594—607).—In leaves of *S. alba* the total sugar content is of the same order as that of other plants but the starch content is smaller. The rate of translocation of the assimilate is approx. equal to that of formation. Daily variations in sugar and starch contents are recorded and discussed. A. G. P.

Induction in the assimilation of carbon dioxide by green algæ. H. GAFFRON (Naturwiss., 1937, **25**, 715—717).—Experiments are described which support the explanation of the induction effect in CO_2 assimilation by green algæ previously put forward (A., 1937, III, 409). In some stems of *Scenedesmus* photosynthesis is much less sensitive to HCN than is respiration and splitting off of H_2O_2. Poisoned cells assimilate rapidly on exposure to light even though respiration and catalase production are almost completely stopped. In this state the assimilation is very sensitive to H_2O_2. No H_2O_2 can be formed as an intermediate compound in the photosynthesis of *Scenedesmus*. The velocity of assimilation after a period in the dark under aërobic and anaërobic conditions was also investigated. The richer are the cells in reducing substances the longer delayed is the return to normal assimilation from the higher val., and the greater the difference between the velocities of assimilation under aërobic and anaërobic conditions. Under optimal conditions the velocity of assimilation is determined by the position of the equilibrium between oxidation and reduction of the photocatalyst. A. J. M.

Effect of light intensity on the photosynthetic efficiency of tomato plants. A. M. PORTER (Plant Physiol., 1937, **12**, 225—252).—Diminution of light intensity increased stem and leaf production and decreased formation of fruit and photosynthetic activity. The fresh wt. of tomato plants and the % of dry matter and ash therein are closely related to the average light intensity, which is the primary factor controlling chlorophyll formation, fruit production, and photosynthetic activity. Optimum setting and development of fruit is associated with a definite level of light intensity. Basal plant metabolism and the contributory factors are regulated by the amount of light received. The influence of temp. and R.H. is examined. A. G. P.

Continuous measurement of photosynthesis, respiration, and transpiration of lucerne and wheat growing under field conditions. M. D. THOMAS and G. R. HILL (Plant Physiol., 1937, **12**, 285—307).—Appropriate apparatus is described. The rate of photosynthesis in lucerne is a linear function of light intensity up to a limiting val. (52% of normal max. in Utah). Above this limit increased intensity has little effect. Rates of respiration vary with temp. and increase approx. 4-fold in the range 0—20°. In a late-season lucerne crop 16·5% of the (net) CO_2 assimilated appeared in the top growth. In wheat the rate of assimilation reaches a max. in the flowering stage and subsequently declines; 83% of the total assimilation appeared in the top growth. A. G. P.

Relation of sulphur dioxide in the atmosphere to photosynthesis and respiration of lucerne. M. D. THOMAS and G. R. HILL (Plant Physiol., 1937, **12**, 309—383).—Fumigation with SO_2 under various conditions resulted in a decrease in the rate of photosynthesis followed by a return to normal, and in some cases > normal, levels. The effect was apparent even when fumigation caused no visible injury to the plants. Leaves absorbed considerable amounts of SO_2, part of which was excreted *via* the roots. A. G. P.

Nature of the Blackman reaction in photosynthesis. R. EMERSON and L. GREEN (Plant Physiol., 1937, **12**, 537—545).—Experimental data do not support the view that the Blackman reaction involves decomp. of H_2O_2 by catalase. Warburg's "acceptor" theory is worthy of consideration as a basis for constructing a theory of the mechanism of photosynthesis. A. G. P.

Photosynthesis and carbohydrate changes in the banana plant, connected with the peculiar leaf structure. A. KURSANOV and S. MANSKAJA (Bull. soc. nat. Moscou, Sect. biol., 1935, **44**, 205—215).—Photosynthetic activity diminished from the base to the tips of leaves. The proportion of conducting tissue in leaves is small and products of photosynthesis accumulate in terminal areas. The leaves contain much sucrose but no invert sugar. The order is reversed in stems. Hemicellulose was abundant in all parts of the plant. CH. ABS. (*p*)

Lighting of plants and their leaf pigments. K. EGLE (Planta, 1937, **26**, 546—583).—Transmission, reflexion, and absorption of light of various λλ by different leaves is examined in relation to their chlorophyll-*a* and -*b*, carotene, and xanthophyll contents. In the middle zone of the spectrum and in the blue-green chlorophyll-*b* shows stronger absorption than does -*a*. In the red–orange zone -*a* shows the greater absorption. A. G. P.

Hormones of the vegetable kingdom. REICHERT (Pharm. Ztg., 1937, **82**, 1041—1043).—A brief review.

Influence of hetero-auxin on morphogenesis in *Circaea* (Sachs phenomenon). R. DOSTÁL and M. HOŠEK (Flora, 1937, **31**, 263—286).—Growth responses to applications of hetero-auxin–lanolin paste (I) to various organs are examined. The accelerated ageing of lower leaves of *Circaea* effected by (I) is associated with increased hydrolysis of starch and consumption of reserve substances. A. G. P.

Stimulation of cambial activity, locally in the region of application and at a distance in relation to a wound, by means of hetero-auxin. A. B. BROWN and R. G. H. CORMACK (Canad. J. Res., 1937, **15**, C, 433—441).—Application of hetero-auxin–lanolin paste to cuttings of leader shoots of balsam poplar stimulated cambial activity locally and also at distance at a bridged ring on the stem, the two effects being independent. The mechanism of this action is discussed. A. G. P.

Effect of ultra-violet light on indolyl-3-propionic acid. D. HARE and H. KERSTEN (Plant Physiol., 1937, **12**, 509—518).—Irradiation (Hg arc)

of the acid (I) alters its physiological action on plant roots and probably causes preliminary formation of indole (II), followed by esterification of breakdown products of the (II) ring. After 8 hr. exposures in aq. solution $>\frac{7}{8}$ of the (I) is decomposed. A. G. P.

Parthenocarpic fruits induced by spraying with growth-promoting chemicals. F. E. Gardner and P. C. Marth (Science, 1937, **86**, 246—247).—Spraying the flowers of *Ilex opaca* with dil. aq. indolyl-acetic (I), -butyric, and -propionic acid and $C_{10}H_7 \cdot CH_2 \cdot CO_2H$ (II) induced parthenocarpy. (II) is the most potent, and a concn. of 0·006% caused all the flowers to set fruit. AcOH produced no effect. Watering the soil around young plants in bloom with a relatively conc. (0·15%) solution of (I) also caused some fruits to set. L. S. T.

Algæ and growth-substances. M. A. Brannon (Science, 1937, **86**, 353—354).—A preliminary report of the effect of 1-$C_{10}H_7 \cdot CH_2 \cdot CO_2H$, 3-indolylacetic and 3-indolylpropionic acid, and $CH_2Ph \cdot CO_2H$ on the unicellular algæ *Chlorella vulgaris*, *C. pyrenoidosa*, and *Oocystis* sp. Concns. of 1 in 10^4 to 1 in 5×10^4 were lethal, and those of 1 in 10^5 to 1 in 3×10^6 had a stimulating effect on all cultures, the rate of cell reproduction being accelerated and the size of cells being increased. The optimum p_H was 5·6—6·5. L. S. T.

Plant growth-substances. XXVI. Effect of biotin, aneurin, and *meso*inositol on the growth of fungi. F. Kögl and N. Fries (Z. physiol. Chem., 1937, **249**, 93—110).—Some of the phycomycetes, ascomycetes, and basidomycetes do not grow on synthetic media unless one or more of the growth-substances biotin (I), *meso*inositol (II), and aneurin (III) is added; others not requiring added growth-substances are stimulated in some cases by their addition. β-Alanine and *l*-leucine do not promote the growth of these fungi. In presence of (II) or (II) + (III), (I) at a dilution of $1 : 25 \times 10^{10}$ stimulates the growth of *Nematospora gossypii* but the optimal concn. of (I) is $1 : 25 \times 10^8$. Some of the fungi not stimulated by the growth-substances probably produce their own requirements thereof and some produce (I), others (III), in amounts sufficient to promote growth of fungi which require them. W. McC.

Effect of animal extracts on plant growth. O. Verona and V. Saggese (Riv. Biol., 1937, **23**, 221—228).—Aq. glycerol extracts of fœtus (rabbit, *Anguilla vulgaris*), with or without peptic hydrolysis, diminish the % germination of wheat and its subsequent development. During growth of wheat, the extracts have a variable effect. The actions are not considered to be specifically biological. F. O. H.

Auxin in the chick embryo. I. Its presence and the change in concentration with age. T. W. Robinson and G. L. Woodside (J. Cell. Comp. Physiol., 1937, **9**, 241—260).—A technique for extracting auxin (I) from animal tissues is described. (I) is present in the unincubated egg and the chick embryo, and is probably synthesised by the developing embryo. M. A. B.

Auxin and leaf formation. M. Snow and R. Snow (New Phytol., 1937, **36**, 1—18).—Effects of auxin in stimulating the development of leaf primordia and in inducing related changes are described. A. G. P.

Electrical polarity and auxin transport [in plants]. W. G. Clark (Plant Physiol., 1937, **12**, 409—440).—Apices of coleoptiles are electrically negative and the p.d. of sections ∝ their length. Inversion of sections inverts their polarity. The bearing of results obtained on the translocation of auxin in plants is discussed. A. G. P.

Growth and production of growth-substance in seedlings of *Raphanus sativus* in moist and dry air. C. J. Gorter and G. L. Funke (Planta, 1937, **26**, 532—545).—Growth and cell extension in the seedlings grown in a moist atm. were > but production of growth-substance (I) was < in seedlings grown in a dry atm. Inactivation of the natural (I) of the stems of seedlings was not apparent. Auxin -*A* in stems is inactivated to similar extents in dry and moist atm. *R. sativus* grown in a moist atm. has the same sap concn. as when grown in a dry atm. but in the former case the cells have approx. double the elasticity and plasticity. The possibility that the (I) of *R. sativus* is not identical with auxin-*A* is discussed. A. G. P.

Polarised growth and cell studies on the *Avena* coleoptile, phytohormone test object. G. S. Avery, jun., and P. Burkholder (Bull Torrey Bot. Club, 1936, **63**, 1—15).—Cell elongation and increase in cell nos. occur only in the long axis of the organ, *i.e.*, growth is polarised. Cell division is probably not involved in coleoptile growth during its use in Went's hormone test. Ch. Abs. (*p*)

Micro-method for determining growth-substances of the *A*-group. P. Boysen-Jensen (Planta, 1937, **26**, 584—594).—Growth-substance (I) is extracted from plant material with $CHCl_3$–HCl or with Et_2O–AcOH. After evaporation of the solvent the residue is dissolved in Et_2O and transferred to an agar plate (apparatus described). The concn. of (I) in the agar is determined by the *Avena* test. A. G. P.

Seed leaf stems of *Vicia* as indicators of the inhibitory action of growth-substance. R. Dostál (Planta, 1936, **26**, 210—221).—Application of growth-substance to swollen seeds of *Pisum sativum*, *Vicia faba*, *V. sativa*, *Lathyrus sativus*, *Lens esculenta*, or *Cicer arietinum* inhibits the elongation of the seed leaf stem, the seed leaves, and roots. Seed leaves in turn affect the growth of the shoot. Treatment of the radicle inhibits the elongation of the seed leaf stem but accelerates shoot growth. A. G. P.

Purification of traumatin, a plant wound hormone. J. Bonner and J. English, jun. (Science, 1937, **86**, 352—353).—A procedure is outlined. The name "traumatin" is given to the active principle of the wound hormone. Chemical properties are tentatively reported. L. S. T.

Spike disease of sandal (*Santalum album*, Linn.). XVII. Factors relating to the abnormal accumulation of carbohydrates in diseased tissue. A. V. V. Iyengar (J. Indian Inst. Sci., 1937, **20**, A, 1—14; cf. B., 1935, 472).—Spiked leaves

have diastatic activity > normal, the property being retained by EtOAc extracts of leaves and by the extracted residue. Diseased leaves contain less extractable matter but higher tannin contents than healthy ones. Tannins in healthy leaves were of the pyrocatechol and those of diseased leaves of the pyrogallol type. Pyrogallol accelerated amylase activity in both healthy and diseased leaves whereas pyrocatechol inhibited the activity of diseased > that of healthy leaves. Increase in starch contents of leaves commences with the appearance of spike. At a later stage there is an increase in sugar which is not derived from accumulated starch but probably from fatty constituents of which spiked leaves contained relatively lower proportions. Starch accumulation results from defective translocation brought about by non-availability of Ca in diseased leaves. A. G. P.

Synthesis of natural substances, particularly alkaloids, under physiological conditions and its relationship to the question of the formation of vegetable compounds in the cell.—See A., II, 526.

Determination of coumarin in sweet clover. Comparison of the steam-distillation and alcoholic-extraction methods. I. J. Duncan and R. B. Dustman (Ind. Eng. Chem. [Anal.], 1937, **9**, 471—474; cf. B., 1937, 1406).—Extraction gives low vals., whilst the amount removed by one steam distillation is a const. proportion of the total coumarin (I), which is entirely removed by four distillations. (I) in the distillate is determined colorimetrically. F. R. G.

Odorous substances of green tea. IX. Carbonyl compounds of black tea oil. S. Takei, Y. Sakato, and M. Ono (Bull. Inst. Phys. Chem. Res. Japan, 1937, **16**, 773—782).—Oil from black Formosa tea dust contains CHMeEt·CHO, Bu$^{\beta}$CHO, Pr$^{\beta}$CHO, Pr$^{\alpha}$CHO, COMeEt, PhCHO, a C_{5-6} ketone, and a ketone $C_6H_{12}O$ (cf. A., 1936, 125). From green tea oil, only PhCHO is isolated. Δ^{α}-Hexenaldehyde cannot be detected in black tea oil (cf. A., 1935, 796). E. W. W.

Essential oil of black tea. III. R. Yamamoto and K. Ito (Bull. Agric. Chem. Soc. Japan, 1937, **13**, 736—750; cf. A., 1935, 1289).—The oil obtained by steam distillation of Formosan black tea contains $EtCO_2H$, Bu$^{\beta}CO_2H$, *n*-hexoic, hexenoic, octoic, palmitic, and salicylic acids, hexenol, hexanol, *n*-octanol, linalool, hexaldehyde, PhCHO, *o*-, *m*-, and *p*-cresol, quinoline, and an unidentified S compound, b.p. 102—112°. J. N. A.

Wax from the leaves of sandal (*Santalum album*, L.). A. C. Chibnall, S. H. Piper, H. A. el Mangouri, E. F. Williams, and A. V. V. Iyengar (Biochem. J., 1937, **31**, 1981—1986).—The saponified wax yields a small amount of fatty acid, the unsaponifiable material consisting of palmitone (*n*-hentriacontan-16-one), 44%, d-10-*hydroxypalmitone*, m.p. 96·4—96·6°, 6%, and mixed primary alcohols (approx. 75% of *n*-$C_{28}H_{57}$·OH and 25% of *n*-$C_{30}H_{61}$·OH), 50%; no paraffin is present. n-*Hentriacontane*-10 : 16-*dione*, m.p. 87·9—88·1°, d-n-*hentriacontan*-10-*ol*, m.p. 81—81·2°, and n-*triacontan*-15-*one*, m.p. 78·8—79·2°, were prepared. F. O. H.

Separation of carbonyl compounds from wax. H. A. el Mangouri (Biochem. J., 1937, **31**, 1978—1980).—Ketonic substances in wax condense with *p*-carboxyphenylhydrazine (Anchel and Schoenheimer, A., 1936, 989) in presence of AcOH and C_5H_5N and the hydrazones are separated from the non-reacting components by dissolution of the Ba salts in boiling MeOH and regenerated by treatment with alcoholic CH_2O or $AcCO_2H$. The application of the method is exemplified. F. O. H.

Component fatty acids of the phosphatides of soya bean and rape seeds. T. P. Hilditch and W. H. Pedelty (Biochem. J., 1937, **31**, 1964—1972).—The principal fatty acids in the phosphatides of soya bean are palmitic (I), hexadecenoic (II), oleic (III), and linoleic (IV) with small amounts of stearic, arachidic, linolenic, and C_{20} unsaturated acid. Rape seed phosphatides contain (III), (IV), and erucic, with smaller amounts of myristic, (I), (II), and acids equiv. to behenic acid. Comparative data for glyceride-fatty acids are also given. F. O. H.

Unsaponifiable matter of algal fats. III. Toxic components. K. Shirahama (Bull. Agric. Chem. Soc. Japan, 1937, **13**, 705—709; cf. A., 1936, 1307).—Injection of the unsaponifiable matter (sterol-free) from the fat of *Alaria crassifolia*, *Cystophyllum hakodatense*, and *Laminaria ochotensis* into rats produced the characteristic cramp and narcotic effects which are given by the toxic compounds of cod-liver oil (Kawakami and Yamamoto, A., 1935, 233). J. N. A.

Pectic substance of plants. V. Nature of pectin and pectic acid. F. W. Norris and C. E. Resch (Biochem. J., 1937, **31**, 1945—1951; cf. A., 1937, III, 367).—Pectins (I) prepared by different methods from different sources (orange peel, apple, beet, hops) show the same general characters but differ significantly in detail of constitution. Pectic acid (II) prepared from (I) is not a chemical entity, its composition depending on the period of treatment of the cell-wall material with alkali [which increases the uronic acid content of the resultant (II)] and $(NH_4)_2C_2O_4$. F. O. H.

Quercetin glucoside from *Trifolium* flowers. S. Hattori, M. Hasegawa, and K. Hayashi (Acta Phytochim., 1937, **10**, 147—153).—The trifoliin (I) and *iso*trifoliin of Nakaoki (J. Pharm. Soc. Japan, 1933, **53**, 238) from the flowers of *Trifolium repens*, L., are shown to be identical. (I) is shown by mixed m.p. to be identical with *iso*quercitrin and gives a $(OMe)_4$-derivative, m.p. 222°, which on hydrolysis yields 5 : 7 : 3′ : 4′-tetramethylquercetin. P. W. C.

Fructosides of Amaryllidaceæ. *Lycoris* and *Narcissus*. H. Belval (Bull. Soc. Chim. biol., 1937, **19**, 1158—1163).—Leaves of *L. squamigera*, Max., and *L. radiata*, Kunth., contain besides starch two fructosides, *lycoroside*-A, [α] −34°, containing fructose and 10% of glucose, and lycoroside-*B*, [α] −20°, which is identical with asphodeloside (I). *N. pseudonarcissus*, L., contains only starch and (I). P. W. C.

Ferric salts as precipitants in the extraction of certain heterosides. R. Luneau (J. Pharm. Chim., 1937, [viii], **26**, 256—259).—Hérissey and Laforest's technique (cf. A., 1932, 662) is modified by the use of $Fe_2(SO_4)_3$ instead of $Pb(OAc)_2$. J. L. D.

Vitamin-*C* and its derivatives in the South American bark, *Chuchuhuasha*. E. Perrot, L. Millat, and R. Colas (Bull. Sci. Pharmacol., 1937, **44**, 325—328).—The total -*C* content of the bark is approx. 1·2 g. per kg., of which one third is in the reduced form. In leaves the proportion of reduced to esterified -*C* is 1 : 3. Root bark contains a *glucoside* of -*C*, m.p. 172°, together with an alkaloid, a flavone pigment, a pyrocatechol tannin, and a phytosterol. J. L. D.

Colloidal reactions of cellulose membranes. W. K. Farr (J. Physical Chem., 1937, **41**, 987—995; cf. A., 1935, 1541).—The structure and properties of plant membranes are discussed. F. L. U.

Composition of some less common vegetable fibres. Structure of cellulose.—See B., 1937, 1185.

Biological decomposition of lignin. A. G. Norman (Sci. Progr., 1936, **30**, 442—456).—A review. Ch. Abs. (*p*)

Fluorescence and photodecomposition of solutions of chlorophyll-*a* under oxygen, carbon dioxide, and nitrogen.—See A., I, 549.

Reversible oxidation of chlorophyll.—See A., I, 629.

Monolayers and multilayers of chlorophyll.—See A., I, 613.

Constitution of cerberin.—See A., II, 513.

Sapogenin of *Gleditschia horrida*, Nakino.—See A., II, 512.

Biological value of the proteins of certain cereals. Z. Markuze (Biochem. J., 1937, **31**, 1973—1977).—Tabulated data for common Polish cereals fed to rats give the series fine buckwheat meal (2·98) > whole buckwheat groats > rolled oats > barley meal > rice, semolina, whole wheat grain > wheat flour > millet meal (0·95). F. O. H.

Hydrolytic properties of *Carica papaya* latex and latex preparations. M. Frankel, R. Maimin, and B. Shapiro (Biochem. J., 1937, **31**, 1926—1933).—The latex hydrolyses both gelatin (I) and peptone (II). The Et_2O-insol. fraction may be separated to give a centrifugate with the properties of papain. The supernatant liquid, treated with EtOH, yields a ppt. with a lower activity towards (II), and contains a thermostable activator of (II)- but not of (I)-cleavage. No activator was found in the fruit press juice. H. G. R.

Composition of the pollen of some Ranunculaceæ and their systematic position. C. S. Bourdouil (Compt. rend., 1937, **205**, 336—337).—Analyses are recorded of the total N in the pollen of different members of this family. Pollen of species of the *Aquilegia* type contains about 7%, that of the *Clematis* type 5·5%, and that of the *Ranunculus* type 4·4% of total N. Morphologically similar members of the family have pollen of approx. the same total N content. J. L. D.

Histo-chemical investigations of lignified cell-walls. J. Kisser and K. Lohwag (Mikrochem., 1937, **23**, 51—60).—The tangential wall of newer pine cells is much more readily swollen than the radial wall or the wall of old wood. This explains the characteristic disintegration produced in this wood by *Fomes Hartigii*, which spreads principally in old wood and disintegrates the tangential walls. Mechanical strain of lignified cell walls causes a mechanical decomp. and such walls then give the cellulose reaction without previous delignification. J. W. S.

Determination of arsenic in small amounts in biological materials. H. J. Morris and H. O. Calvery (Ind. Eng. Chem. [Anal.], 1937, 9, 447—448).—After preliminary treatment of the sample with H_2SO_4, HNO_3, and then $HClO_4$, As is liberated as AsH_3, collected in a heated glass tube as an As mirror, dissolved in HNO_3, and determined colorimetrically with $(NH_4)_6Mo_7O_{24},4H_2O$ and N_2H_4,H_2SO_4 with the aid of a spectrophotometer. E. S. H.

Determination of bismuth in body-fluids and tissues. A. J. Lehman, A. P. Richardson, and P. J. Hanzlik (J. Lab. Clin. Med., 1935, **21**, 95—97).—Improvements in the method of Hanzlik and Mehrtens (Arch. Dermatol. Syphilol., 1930, **22**, 483—495) permit determination of 0·001 mg. of Bi. Ch. Abs. (*p*)

Determination of lead in biological materials. Comparison of spectrographic, dithizone, and *s*-diphenylcarbazide methods. J. Cholak, D. M. Hubbard, R. R. McNary, and R. V. Story (Ind. Eng. Chem. [Anal.], 1937, 9, 488—490).—For ordinary work involving >1 μg. of Pb the spectroscopic and dithizone methods are equally satisfactory; for <1 μg. of Pb the spectrographic method is superior. The carbazide method is useful for large samples and satisfactory when the Pb content is such that the loss inherent in the method (approx. 0·07 mg. per sample) is insignificant. E. S. H.

Determination of lead. Photometric dithizone method as applied to biological material. D. M. Hubbard (Ind. Eng. Chem. [Anal.], 1937, 9, 493—495).—The solution of the ash of the material is extracted with dithizone in $CHCl_3$ in three steps and the Pb content of the extract determined photometrically. If Bi is present, it must be removed, but other metals usually found in biological materials do not interfere. With amounts of Pb <10 μg. the error is about 0·8 μg. E. S. H.

Spectroscopic determination of metals in small samples [of plant ash]. Calcium, magnesium, potassium, manganese, iron, and phosphorus. D. T. Ewing, M. F. Wilson, and R. P. Hibbard (Ind. Eng. Chem. [Anal.], 1937, 9, 410—414).—The sample is dissolved in a solution containing NaCl 5, HCl 4·5, and NH_4Cl 45 g. per litre. The conditions of arc excitation, exposure, etc. required to give the max. gradation of density for the selected spectral lines have been determined. E. S. H.