BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

A., III.—Physiology and Biochemistry

MARCH, 1938.

(a) HISTOLOGY.

Perdrau-Ghigi method of silver impregnation. G. BAZZOCCHI (Boll. Soc. ital. Biol. sperim., 1937, 12, 639-641).—A modification of the method is described for staining reticulated tissue. F. O. H.

Dioxan as a fixative of yolk. H. SZARSKI (Science, 1937, 86, 620).—Fixation with dioxan avoids hardening of embedded embryonic tissue.

C. A. K.

Apparatus and methods for micro-incineration. S. H. GAGE (Stain Tech., 1938, 13, 25— 36).—A description of the prep. of incinerated sections for the study of the mineral content of cells, tissues, and organs. E. M. W.

Staining nerve fibres with silver in tissue fixed with Bouin's fluid. J. O. FOLEY (Stain Tech., 1938, 13, 5—8).—Axons of organs fixed with Bouin's fluid can be stained by the Davenport Ag method following treatment with conc. pyridine (1 hr.), ammoniated alcohol (24 hr.), and 40% aq. AgNO₃ (6—8 hr.). E. M. W.

Dehydration and clearing agents. P. RALPH (Stain Tech., 1938, 13, 9—15).—From a comparison of fixatives, dehydrating and clearing agents, Bouin's fluid, dioxan, and chloroform are shown to produce least distortion, shrinkage, and hardening. E. M. W.

Embedding plate. J. R. KING (Stain Tech., 1938, 13, 23—24).—A plate is heated by a small electrical unit and cooled by circulating water, thus avoiding moving the embedding dish. E. M. W.

Claudius' stain. V. JENSEN (Zentr. Bakt. Par., 1937, I, 139, 333—335).—Modifications of the Gram-Claudius stain are recommended for staining Grampositive bacteria in film preps. and sections.

L. D. G.

Investigations with non-aqueous solutions. VI. Staining with non-aqueous solutions. VII. Aniline, phenol, and pyridine in the staining of structures rich in lipin. Theory of bacterial and chondriosomal staining. M. SEKI (Z. Zellforsch., 1937, 27, 603-619, 620-636).—VI. Stains are divisible into three groups, fat-sol., water-sol., and insol. Some of the properties of these three groups are given in detail, and include the intensity of staining produced when the stains are dissolved in various solvents.

VII. Aniline, phenol, and pyridine help the staining of tubercle bacilli by reacting with the waxy portions and allowing the dye to combine. The majority of bacteria are stained by the Fe-phenol-

hæmatoxylin method (where 3—5% of phenol is added to the hæmatoxylin). Chondriosomes, which are dense structures rich in lipin, are faintly stained with dye solutions containing aniline or phenol, but better results are obtained by several other methods, including the Fe-phenol-hæmatoxylin method. The estimation of the isoelectric point of the tubercle bacillus, chondriosomes, and other structures of a dense lipin nature is impossible by staining methods. R. J. O'C.

Mitosis. I. Number and course of mitoses in tissue culture. W. VON MÖLLENDORFF (Arch. exp. Zellforsch., 1938, 21, 1—66).—The no. of mitoses seen in tissue cultures of dog subcutaneous tissue were increased by addition of KCl, unchanged by KCNS, and decreased by sucrose. Attention must be paid to the time taken for a single mitosis as well as changes in the relative duration of any of the phases. Anti-coagulating salts delay mitosis more than coagulating. Changes of viscosity in fibrocytes during mitosis were studied. R. J. O'C.

Mitosis. II. Phase distribution in cultures of fibrocytes and its variation with the addition of various substances. W. VON MÖLLENDORFF (Z. Zellforsch., 1937, 27, 301—325).—The effect of adding various substances to cultures of fibrocytes has been measured by plotting the "phase curve" of the mitoses observed. This consists of dividing the phases of mitosis into groups and making differential counts of the no. of cells in each of the groups. The substances added were mainly crystalloids and all altered the "phase curve." The changes are to some extent characteristic of each particular substance.

R. J. O'C. Vital staining by electrophoresis. M. IOKO-WICZ (Compt. rend. Soc. Biol., 1937, 126, 880-881). A 2% solution of trypan-blue on the negative electrode penetrates rats' skin on application of a galvanic current of 20 v. D. T. B.

Collagen, elastin, and reticulin in the skin. B. JALOWY (Z. Zellforsch., 1937, 27, 667—690).—The formation of reticulin or argyrophile fibres in the skin is a temporary and reversible process; both collagenous and elastic fibres may sometimes show argyrophilia. The intensity of staining is greatest in the neighbourhood of cells. The argyrophile fibres do not differ functionally from other fibres; their increase in pathological states merely represents a physicochemical change whereby they become more permeable to Ag compounds. This is associated with swelling of the fibres. R. J. O'C. Histological and comparative physiological studies of the splenic sheaths of Schweigger and Seidel. P. DUSTIN, jun. (Arch. Biol., 1938, 49, 1—100).—The sheath of Schweigger and Seidel from fish to mammal is described. It consists of cells which surround the terminations of the capillaries of the splenic artery. These capillaries are permeable to plasma and blood cells; the latter pass between the cells of the sheath to reach the pulp or the sinusoids. The cells of the sheath resemble those of the reticuloendothelial system, but are hæmolytic rather than phagocytic. H. A. HA.

(b) BLOOD AND LYMPH.

Hæmatological observations on bone marrow obtained by sternal puncture. P. VOGEL, L. A. ERF, and N. ROSENTHAL (Amer. J. clin. Path., 1937, 7, 436—447, 498—515).—The technique of sternal puncture, the various cells found in the bone marrow as stained by the Jenner–Giemsa method, and the normal differential count range found in 21 normal adults are described. By placing citrated marrow fluid in a Wintrobe tube and centrifuging, a relatively accurate red-cell vol., white-cell vol., and platelet vol. were determined. The findings in 246 cases of various hæmatological and other diseases are given and the val. of the examination is discussed. C. J. C. B.

Autonomic innervation of bone marrow. K. MORIKAWA (Klin. Woch., 1938, 17, 57–59).— Histological changes in the bone marrow were studied, on young dogs and cats, after unilateral extirpation of the abdominal sympathetic chain or the spinal ganglia (L 4, 5, S 1). Sympathetic nerves inhibit, and parasympathetic nerves stimulate, bone marrow activity. B. K.

Leucocyte picture in Iraq. W. P. KENNEDY (Trans. Roy. Soc. trop. Med. Hyg., 1937, 31, 309-332).-The differential leucocyte count and polynuclear index were carried out on 350 carefully controlled healthy British airmen and 50 healthy Iraqi medical students. The ranges of the different cells were : polymorphs 35-75%; lymphocytes 9-48%; monocytes 3-29.5%; eosinophils 0-13%; polynuclear index 1.3-2.5. Statistical tests showed that the variations were consistent with the normal curve of frequency distribution. The incidence of cells not usually found in the circulation (Turk, Reider, plasma, stem, myelocytes, and metamyelocytes) was increased. The alterations in the blood compared with European standards were probably due to climate. Similar studies were carried out on malaria, tuberculosis, leprosy, phlebotomus fever, and bilharziasis. The polynuclear index showed a shift to the left compared with Iraq normals, so that its use was not invalidated. In malaria the monocytes were within the normal Iraq range. Relative lymphocytosis was characteristic of leprosy, and basophils were more common than in other groups. In phlebotomus fever numerous degenerated cells were seen, the eosinophils were reduced, and neutropenia and monocytosis with a low polynuclear index were present. C. J. C. B.

Ætiology and pathology of agranulocytic angina. Present-day findings and hypotheses.

Origin of neutrophils in pernicious anæmia. O. P. JONES (Arch. Int. Med., 1937, 60, 1002—1015).— 15 biopsy specimens of bone marrow from patients with pernicious anæmia during a relapse showed marked anisocytosis and macrocytosis of the leucopoietic elements. All stages of neutrophilic development showed abnormalities. The neutrophils seen in pernicious anæmia are not toxic alterations of normal neutrophils, but represent a true pathological series from the bone marrow. T. H. H.

Cannibalism and chemotaxis in hen "monocytes" in vitro. F. JACOBY (J. Physiol., 1938, 91, 22—24P).—Under certain conditions monocytes are eaten by their fellows; positive chemotaxis is involved. J. A. C.

Action of the follicular hormone on the blood and blood vessels. O. ARNOLD, H. HAMPERL, F. HOLTZ, K. JUNKMANN, and H. MARX (Arch. exp. Path. Pharm., 1937, **186**, 1—24).—Prolonged administration of follicular hormone to dogs causes leucocytosis followed by leucopenia, affecting principally the neutrophils, and also an anæmia secondary to multiple diffuse purpuric hæmorrhages. The effect is produced only by very heavy dosage, and is not seen in other mammals than the dog. T. B. H.

Active principle causing increased capillary permeability in inflammation. V. MENKIN (J. Exp. Med., 1938, 67, 129-144).-Inflammatory exudates contain an active principle (leucotaxine) increasing capillary permeability; it is obtained in purified cryst. form by treating the cell-free exudate with pyridine and acetone and subsequent extraction with butyl alcohol. It is a brownish, doubly refractive, hygroscopic substance, sol. in methyl and butyl alcohol, dil. acids, and normal saline, sparingly sol. in water, and insol. in ether and abs. alcohol. It is resistant to acid but inactivated by alkali. It is thermostable, readily diffusible, and pptd. by saturated (NH₄)₂SO₄. Xanthoproteic, Adamkiewicz, and ninhydrin tests are positive; other amino-acid tests and biuret test negative. Experiments show that there is an increase in amino-acid-N in inflammatory exudate compared with blood, suggesting proteolysis. The active principle is not histamine and may be a simple polypeptide. A. C. F.

Cell migration in inflammation. V. MENKIN (J. Exp. Med., 1938, 67, 145—152).—The purified active principle, leucotaxine, obtained from inflammatory exudate, increases capillary permeability and diapedesis of granulocytes. Non-sp. irritants, such as turpentine, markedly increase capillary permeability but not cell migration. Granulocytic migration occurs *in vitro* with leucotaxine.

A. C. F.

Proteolysis and chemotactic substance in inflammation. V. MENKIN (J. Exp. Med., 1938, 67, 153—158).—Increase of capillary permeability and leucocytic migration results from injecting a tryptic digest of serum. Purification of the digest yielded a cryst. substance similar to leucotaxine. No such active substance could be obtained from undigested serum. Leucotaxine is therefore regarded as probably an intermediate proteolytic product.

A. C. F.

Erythrocyte formation in Sphenodon (Hatteria) punctatus, Grey. W. KOMOCKI (Arch. Biol., 1938, 49, 101—110).—Blood films of Sphenodon show that the cells are all of the hæmatoblast type. No lymphocytes are found. H. A. HA.

Experimental anæmia. I. Technique and syndromes. II. Experimental therapy. L. BINET and M. V. STRUMZA (J. Physiol. Path. gén., 1937, 35, 30—43, 44—49).—I. The blood-picture and biochemical findings in 94 dogs rendered anæmic by bleeding are described. Coagulation time and alkaline reserve are lowered. Leucocytosis is marked. Blood-Cl (particularly corpuscular) and blood-lactic acid increase, and N metabolism and elimination are deranged. Neurological disturbances (loss of function and sensation) occurred in 4 dogs, but disappeared on recovery from the anæmia.

II. Chlorophyll (in oily solution) by mouth increased hæmoglobin production rather than cell formation. Fe salts, by mouth or parenterally (gluconate), largely increased hæmoglobin formation, whereas Cu salts stimulated cell formation; their combination is therefore recommended therapeutically. Carotene increased both cell and hæmoglobin formation. C. A. A.

Anæmia of infancy and childhood. XI. Effect of iron-deficient diets on the size of the red blood cells in rats and on the production of microcytic hypochromic anæmia in their offspring. L. G. PARSONS, E. M. HICKMANS, and E. FINCH (Arch. Dis. Childh., 1937, 12, 369-380).-In 5 rats the red-cell count increased from 2,800,000 at birth to 7,800,000 at 3 months of age; the average red-cell diameter fell from $8.79\,\mu$. to $6.19\,\mu$. Rats on a low-Fe but otherwise complete solid diet showed practically normal growth and hæmoglobin, but developed polycythæmia (9-11 million) and microcytosis $(5.5-5.8 \mu)$ with low colour index. Offspring of these rats during lactation showed a slowness in normal rise of red count with a rapidly reduced hæmoglobin below normal. The red cells at birth were microcytic, and diminished in size as growth proceeded. On the Fe-deficient diet after weaning, microcytosis persisted but polycythæmia developed and the hæmoglobin became normal. If they were given milk only after weaning, the anæmia became worse and the red cells smaller than those on the special diet. The cells were restored to normal size by adequate Fe, but only when a trace of Cu was added. Rats fed on the special diet for one generation reproduced and reared their litters fairly well, but the reproductive powers of the offspring fed on the same diet were greatly diminished, their young were reared with great difficulty, were subnormal in wt. and size, and showed pronounced anæmia. Pregnant women on an Fe-deficient diet or with an Fe-deficient anæmia would probably produce offspring with congenital nutritional anæmia. C. J. C. B.

- Retention and utilisation of parenterally administered iron. W. M. FOWLER and A. P. BARER (Arch. Int. Med., 1937, 60, 967-973).—When 0.1 g. of Fe NH_4 citrate was administered intramuscularly at daily intervals to patients with a microcytic hypochromic type of anæmia, the Fe was retained in the body, but there was no regeneration of hæmoglobin. Hæmoglobin regeneration followed larger oral doses. T. H. H.

Availability of the iron of grape juice. W. FISHBEIN, J. K. CALVIN, and J. HEUMANN (Arch. Pediat., 1938, 55, 42—45).—In an institution, one group of 30 children of school age was given 10 oz. daily of grape juice and a similar group none. Their basal diet was similar. In 86 days the first group gained 1.04 mg. of hæmoglobin compared with 0.57 mg. in the second. 10 subjects from each group who had initially the lowest hæmoglobin were also compared. The group receiving grape juice gained 1.17 mg. compared with 0.87 mg. in the other group. It was concluded that the grape juice used was a good source of available Fe. C. J. C. B.

Iron and blood-regeneration. W. HEUBNER and M. FRERICHS (Arch. exp. Path. Pharm., 1937, 186, 671-683).—Preps. of hæmoglobin, blood, or liver powder are without effect in inducing bloodregeneration in dogs rendered anæmic by bleeding, but inorg. Fe salts or mineral waters containing Fe are definitely effective. T. B. H.

Effect of copper in the production of nutritional anæmia in rats. P. L. HARRIS and G. L. POLAND (Science, 1938, 87, 45-46).—Experiments on hæmoglobin regeneration in rats showed that supplementing the basal diet with Cu does not significantly affect the time or severity of Fe depletion, or alter the hæmoglobin response to subsequent Fe feeding.

C. A. K.

Function of liver and blood formation. L. VILLA and A. SALA (Klin. Woch., 1937, 16, 927— 928).—In dogs and rabbits blood flowing from the liver produces reticulocytosis in rats. The blood reaching the liver from the stomach and duodenum or that from the inferior vena cava is without effect. Protein digestion has no influence. F. W. L.

Biliary fistula and hæmoglobin regeneration. W. B. HAWKINS, F. S. ROBSCHEIT-ROBBINS, and G. H. WHIPPLE (J. Exp. Med., 1938, 67, 89-110).-When bile is lost through a fistula, the hæmoglobinregenerating power of an anæmic dog is impaired. Fe by mouth results in only half the expected hæmoglobin regeneration, but given intravenously full regeneration occurs. The results with liver feeding are similar. The animals can be maintained over a period of years at normal wt. and in perfect health. There is no evidence of inadequate protein absorption. The bloodcoagulation time is increased owing to lack of prothrombin. The impairment of hæmoglobin regeneration in these animals is attributed to disturbed liver function and globin formation. A. C. F.

Thyroid gland and hæmatopoiesis. J. C. SHARPE and J. D. BISGARD (J. Lab. clin. Med., 1937, 23, 219—230).—Daily administration of thyroid extract to adult, anæmic, thyroidectomised rabbits caused a reticulocyte response, followed by a sharp and sustained rise in both hæmoglobin and red cell counts. The hæmatopoetic effect was less with high doses of thyroid. Intravenous injections of liver extract had no effect on the blood of either normal or thyroidectomised rabbits. Intramuscular liver extract caused a moderate reticulocyte response in both normal and thyroidectomised animals, and a slight rise in the hæmoglobin and erythrocyte counts of the latter group. Administration of Fe to normal and thyroidectomised animals had no effect on the reticulocytes of either group, and only a slight stimulating effect in the anæmia of myxœdema.

T. H. H.

Red cell and reticulocyte counts in guinea-pigs following exposure to low pressures. A. S. GORDON and W. KLEINBERG (Proc. Soc. Exp. Biol. Med., 1937, 37, 507—509).—Young guinea-pigs, subjected for 5—14 days to pressures of 370—380 mm. Hg, show an increase of up to 50% in red cells and up to 14% in reticulocytes expressed as percentage of total reds. On returning to normal conditions the red cells fall to normal in 3 weeks and the reticulocytes in 4—6 days, but the red cell counts continue to fall for another month, while the reticulocytes increase. Both counts oscillate in this way around the normal level, to which they gradually return after about 4 months. V. J. W.

Blood changes during colchicine poisoning. F. SANTAVY (Compt. rend. Soc. Biol., 1937, 126, 629-632).—In dogs a progressive increase was observed in the erythrocyte vol., the hæmoglobin, and the erythrocytes. H. G. R.

Susceptibility of mammalian erythrocytes to hæmolysis with hypotonic solutions. W. B. CASTLE and G. A. DALAND (Arch. Int. Med., 1937, 60, 949-966).—The differences in the susceptibility of various types of erythrocytes to hæmolysis with hypotonic solution of NaClare due largely to differences in form and not in osmotic behaviour. The percentage increases in equilibrium vols. in hypotonic plasma of erythrocytes of widely different susceptibilities to hæmolysis do not show significant differences. Direct microscopic observations indicate that hæmolysis of a given type of erythrocyte is associated with the assumption of a spherical form in hypotonic plasma and that the more susceptible the erythrocyte is to hypotonic hæmolysis, the less hypotonic is the plasma necessary to cause the assumption of a spherical form. T. H. H.

Icterus complicating pneumonia. I. Corpuscular fragility in the normal negro. E. L. TURNER, M. J. BENT, W. H. GRANT, and G. D. HOLLO-WAY (Proc. Soc. Exp. Biol. Med., 1937, 37, 481-483). —Experiments on 94 negroes under 23 years of age showed that in 14.8% the red cells did not undergo hæmolysis until the NaCl in solution was reduced to 0.36%. In 22% complete hæmolysis did not occur until 0.28% NaCl, indicating that these cells are less fragile than those of the white races as recorded in textbooks. V. J. W.

Effect of X-rays on colloidal properties of erythrocytes. H. Q. WOODABD (J. Physical Chem., 1938, 42, 47-54).—Irradiation of sheep's erythrocytes with X-rays leads to slight swelling and increased susceptibility to hæmolysis when the cells are fresh. The reverse effect is observed with cells kept several days in physiological saline at a low temp. It is inferred that in the former case the hæmoglobin is decomposed into simpler units, and in the latter coagulated. F. L. U.

Effect of sulphanilamide on the blood picture. C. M. CAMPBELL (Lancet, 1938, 234, 247—248).— There was a slight increase in the reticulocyte count in 5 out of 10 patients given moderate doses of sulphanilamide for various diseases. C. A. K.

Effect of blood transfusion on the red cell count of children. K. H. SCHAEFER (Jahrb. Kindhlk., 1937, 150, 267—281).—The hæmoglobin and red cell count reach their max. 24 hr. after an intravenous transfusion of citrated blood; during this period plasma is lost from the circulation. The pre-transfusion vals. returned 14 days later. The reticulocyte count is temporarily diminished. Intravenous transfusion of serum has no effect on hæmoglobin or red cell count. A. S.

Urticaria during blood transfusion. W. STEWART and T. BATES (Lancet, 1938, 234, 319—320). —Generalised urticaria, profuse sweating, slight dyspnœa, and tachycardia appeared during a blood transfusion on a woman aged 45. C. A. K.

Influence of transfusion on post-operative syndrome. O. LAMBERT, J. DRIESSENS, and H. MALATRAY (Compt. rend. Soc. Biol., 1937, 126, 1201— 1202).—Blood transfusion after surgical operation prevents hypochloræmia and acidæmia and increase of polypeptides in the blood. D. T. B.

Potassium content and cell volume of centrifuged erythrocytes. M. CRABTREE and M. MAIZELS (Biochem. J., 1938, 32, 74—75).—Centrifuging human erythrocytes, at least in rapidly sedimenting blood, causes little or no change in the K or water content. J. N. A.

Ascorbic acid content of red cells and plasma. M. PIJOAN and E. EDDY (J. Lab. clin. Med., 1937, 22, 1227—1230).—The ascorbic acid concn. in the plasma is greater than that in the red cells. T. H. H.

Adenine nucleotide in tissues. III. Erythrocytes; mol. wt. of adenylpyrophosphoric acid. K. LOHMANN and P. SCHUSTER (Biochem. Z., 1937, 294, 183—187; cf. A., 1936, 96).—The isolation of 2·1 g. of Ba adenylpyrophosphate from the erythrocytes of 30 l. of pig's blood is described. The val. (413—485) found for the mol. wt. of adenylpyrophosphoric acid indicates that it is a simple nucleotide. W. McC.

Sub-groups in blood group investigation. V. FRIEDENREICH (Klin. Woch., 1937, 16, 753-754).— The "weak" $N(N_2)$ analogous to A_2 in the *ABO* blood-group system depends on an independent allelomorphic gene. The *N* receptor varies in strength, as it is weaker in the *MN* group than in homozygote *N*-individuals. The potency of the *M*- and *N*receptors in *MN*- (*MN*₁-)individuals varies only slightly; the potency of the receptor designated N_2 in the family investigated by the author was outside the variability of the normal *N* receptor in heterozygote *N*-individuals. Two similar cases were observed: (1) mother *M*, alleged father and child MN_2 ; (2) child N, father MN_2 , mother MN_1 . An uncommon N variant may exist and depends on a special allelomorphic gene. A further rare variant of the A receptor is described and called A_3 ; it is recessive to A_3 and A_2 but dominant to O.

F. W. L.

Application of blood-grouping to South African ethnology. R. ELSDON-DEW (S. Afr. J. Sci., 1937, 33, 976-992).—A general discussion of methods of application to ethnology is given and then applied to the figures published and the present series of blood groupings in African natives. The three indigenous African races differ greatly. The Bantus are not homogeneous. The Bush race and Hottentots show the same frequency of A but differ in B frequency, and it is probable that the Bush race in their purer form had no B. It is concluded that Africa was at first inhabited only by a black race without either Aor B, and was then invaded by races bearing the factor A. Some of these moved south and formed the Bush race. Others moved along the Mediterranean littoral to form the Berbers. Then came a proto-Egyptian invasion bearing both A and B, which spread all over Africa, one portion, with less contact with the original blacks, moving south to form the Hottentots. The remaining blacks, depending on their greater or smaller contact with the invaders, formed the different Bantu tribes. This suggests that the Bush race were in contact with the main mass of mankind after the blacks has separated, but that the latter had since been greatly influenced by some strain coming from near India, which separated after the present Western European races had become separated. C. J. C. B.

A boy with no fibrinogen. R. G. MACFARLANE (Lancet, 1938, 234, 309—312).—A boy of 8 years showed a hæmorrhagic tendency from birth. The blood was found to be incoagulable owing to complete absence of fibrinogen. There was a history of fatal hæmorrhage in one sister, a severe hæmorrhage in one brother (now normal), and low blood-fibrinogen in the father. The boy's parents were first cousins.

C. A. K.

Erythrocyte sedimentation and plasmafibrinogen. W. OAKLEY (Lancet, 1938, 234, 312).---Blood containing no fibrinogen was obtained from the case described in the preceding abstract. The sedimentation rate of erythrocytes was 0.3 and 1.0 mm. at the end of 1 and 2 hr., respectively. Addition of fibrinogen by admixture with different amounts of normal blood showed that the sedimentation rate increased with rising conen, of fibrinogen.

Blood sedimentation and agglutination. T. TEORELL and L. THORLING (Klin. Woch., 1937, 16, 963—964).—The addition of ricin to citrated blood of normal subjects slightly accelerated sedimentation. In blood from many pathological cases the increase in rate was very marked. F. W. L.

Reduced sedimentation rate in congenital cyanosis. G. ROUSSY and M. MOSINGER (Compt. rend. Soc. Biol., 1937, 126, 1064—1066).—In congenital cyanosis the sedimentation rate is slow. This is due to the polycythæmia and the presence of an inhibitory agent in the plasma. D. T. B. Influence of plasma-proteins on sedimentation rate. R. TIFFENEAU and O. GYSIN (Compt. rend. Soc. Biol., 1937, 126, 1160—1164).—Sedimentation rate is diminished by removal of proteins from the plasma by filtration. The rate is the same in ultrafiltrates from different plasmas. Variations of rate depend on the type and amount of plasmaprotein. D. T. B.

Electrophoresis of blood platelets. O. PINOTTI (Arch. Fisiol., 1937, 37, 97—100).—The velocity of migration to the positive pole of platelets suspended in their own plasma varied in different species in relation to the serum-albumin–globulin ratio. It was greater in the rabbit than in the dog, and min. in the horse. Adsorbent powders added to the different plasmas behaved in exactly the same way as the platelets. The negative charge of platelets is attributed to the proteins adsorbed at their surface. G. S.

Photo-electric determination of hæmoglobin in dilute solutions of blood. E. SACERDOTE (Atti R. Accad. Lincei, 1937, [vi], 26, 116—122).—The dil. blood (1—10 p.p.m.) (2 c.c.) is treated with 2% benzidine in acetic acid (2 c.c.) and 5% H_2O_2 (1 c.c.) and the bluish-green colour produced is measured by means of a photo-electric cell and an appropriate yellow filter. F. O. H.

Optical determination of blood-pigment as oxyhæmoglobin, hæmoglobin, and hæmatin. G. BARKAN (Biochem. Z., 1937, 294, 239—248; cf. A., 1937, III, 111).—Tests with the blood of men, rabbits, horses, and guinea-pigs show that the oxyhæmoglobin procedure of Heilmeyer and Sundermann (Deut. Arch. klin. Med., 1936, **178**, 397) and Heilmeyer's hæmoglobin method ("Med. Spektrophotometrie, 1933") yield trustworthy results, but that the colorimetric method, in which the pigment is determined as hæmatin hydrochloride with a hæmometer, does not. W. McC.

Redox system methæmoglobin-hæmoglobin. I. R. HAVEMANN and K. WOLFF (Biochem. Z., 1937, 293, 399-404).—Consistent results can be obtained for the redox potential of the reversible system methæmoglobin-hæmoglobin with a Pt electrode. Above $p_{\rm H}$ 6.4 the chemical reaction is summarised by the equation Hb $-4e \Longrightarrow$ Methb $+4{\rm H}$. A theory of methæmoglobin formation is given. P. W. C.

Methæmoglobin reduction by glutathione and cysteine. D. B. MORRISON and E. F. WILLIAMS (Science, 1938, 87, 15—16).—Experiments in vitro on the rate of reduction of methæmoglobin by cysteine and glutathione suggested that the latter may help to prevent methæmoglobin accumulation in the intact erythrocyte. C. A. K.

Normal level of plasma-bilirubin. J. M. VAUGHAN and G. A. D. HASLEWOOD (Lancet, 1938, 234, 133—135).—From a study of 100 healthy adults it is concluded that the normal level of plasmabilirubin ranges from 0 to 1.3 mg. per 100 c.c. To assess the significance of serum-bilirubin changes urobilin excretion must be known. C. A. K.

Action of Congo-red on normal and leukæmic blood. T. H. C. BENIANS (J. Lab. clin. Med., 1937,

C. A. K.

22, 1246—1251).—A solution of Congo-red inhibits coagulation of blood, phagocytosis, and hæmolysis, but is without action on the sensitisation of red cells, and on red cell and bacterial agglutination. These effects are due to its dispersing action on colloid particles. When mixed with leukæmic blood Congored forms a gel. T. H. H.

Determination of the icteric index by the acetone method. R. A. NEWBURGER (J. Lab. clin. Med., 1937, 22, 1192—1195).—A modification of the acetone method of Ernst and Förster for determining serum-bilirubin is described. T. H. H.

Combination with proteins of certain porphyrins. H. F. HOLDEN (Austral. J. Exp. Biol., 1937, 15, 409-421).—In neutral solution globin changes the ultra-violet absorption spectra of protoporphyrin and of hæmatoporphyrin. Similar but smaller changes are effected by horse serum; casein and gum ghatti have no effect. It is suggested that the differences observed indicate the formation of porphyrin-protein compounds analogous to hæmatinprotein compounds (parahæmatins). D. M. N.

Effects of organic solvents on the blood pigment. H. F. HOLDEN and C. G. SETTER (Austral. J. Exp. Biol., 1937, 15, 405-408).—The amount of renaturation possible after denaturation by alcohol and acetone of oxyhæmoglobin of different species was determined. Gum ghatti or lysalbic acid greatly increased the amount; serum-proteins were without effect. D. M. N.

Methylene-blue and methæmoglobin formation. A. STURM and W. FRANKE (Arch. exp. Path. Pharm., 1937, 186, 306—312).—Injections of methylene-blue into rabbits do not produce methæmoglobinæmia. T. B. H.

Reversibility of denatured and coagulated methæmoglobin. J. ROCHE and R. COMBETTE (Compt. rend., 1937, 205, 1011—1013).—Osmotic pressure measurements indicate that coagulation of methæmoglobin (trichloroacetic acid) followed by reversal by progressive neutralisation, and also denaturation (Na salicylate) and its reversal by prolonged electrodialysis, involve an increase in mol. wt. J. D. R.

Conditions affecting absorption spectra of vital dyes in plasma. M. I. GREGERSON and J. G. GIBSON (Åmer. J. Physiol, 1937, 120, 494—513).— From observations made on 18 dyes representing 9 different tetrazo-dyes it was concluded that the extreme fluctuations in the salt or protein content of circulating blood had no effect on the spectral absorption of the blue dye T-1824, which thus fulfils the requirements for determination of plasma vol.

Heparin and thrombosis. D. W. G. MURRAY and C. H. BEST (J. Amer. Med. Assoc., 1938, 110, 118—119).—The possibility of preventing clinical post-operative thrombosis by intravenous purified non-toxic heparin solution is under investigation. The indiscriminate use of unpurified heparin is dangerous. R. L. N. Chemistry and clinical applications of heparin. E. JORPES (Uppsala LäkFören. Förh., 1937, 43, 83—90).—A review. T. S. G. J.

Formation of profibrin after denaturation of fibrinogen. K. APITZ (Z. ges. exp. Med., 1937, 102, 202—211).—If fibrinogen is denaturated by heating, a sol. intermediate product is formed identical with profibrin formed during coagulation produced by thrombin. Coagulation is attributed to the acceleration, caused by thrombin, of spontaneous denaturation of fibrinogen. A. S.

Method of studying hæmostatic remedies. J. ROSKAM and L. PAUWEN (Arch. int. Pharmacodyn., 1937, 57, 450—466).—Bleeding time was determined for the rabbit's ear under the influence of a stream of water at const. $p_{\rm H}$ and temp. This was compared with that of the other ear under the influence of some modifying factor. D. T. B.

Modifications of blood clotting and surface tension. E. ZUNZ (Arch. int. Physiol., 1937, 45, 454–460).—The influence of a no. of substances which modify blood clotting was studied on the surface tension of plasma, its concn. of globulin, albumin, and fibrinogen, and its proportion of globulin to total protein. The surface tension does not depend on the fibrinogen or globulin concn. only, nor does coagulation depend solely on the surface tension. C. E. B.

Alteration in the immunological specificity of fibrinogen by the action of fibrolysin of the hæmolytic streptococcus. J. JABLONOWITZ (Proc. Soc. Exp. Biol. Med., 1937, 37, 548—552).—Rabbits were immunised with a human fibrinogen solution and their serum was examined for its precipitin action on this solution and on the same solution to which some fibrinolysin had been added. In the second case the ppt., as measured by N content, was much less than in the control. The action of the fibrinolysin on the fibrinogen was complete in about 1 hr. at 37°.

V. J. W.

Toxicity of congealed blood. F. VACIRCA and G. PITZORNO (Boll. Soc. ital. Biol. sperim., 1937, 12, 702).—Injection of blood defibrinated after coagulation into animals of the same species as the blooddonors frequently (but not invariably) produces toxic symptoms and death according to the amount injected. The effect, which is not modified by prior injection of anticoagulants, is not identical with the toxic action of fresh, defibrinated blood. F. O. H.

Blood and tissue changes from parenteral injection of homologous sera. HEINLEIN and MUSCHALLIK (Klin. Woch., 1937, 16, 873—876).— Parenteral injection into rabbits of their own sera produced changes similar to those from heterologous sera, *i.e.*, increase in total protein (principally fibrinogen and globulin). Slight degeneration of cardiac muscle and occasional hepatic necroses were found but vascular changes were more marked.

F. W. L.

Adsorption of the specific precipitable substance in blood. IV. Experiments with antifowl hæmoglobin precipitin. S. K. WANG (J. Orient. Med., 1937, 27, 139-140).—Adsorption in acid media and elution with 1.8% saline made slightly

M. W. G.

alkaline are found to give the best results. Most common adsorbents are effective. P. C. W.

Effect of vitamin-C on antigen-antibody reactions. L. ARMENTANO and A. HAMORI (Z. ges. exp. Med., 1937, 102, 178—184).—Administration of vitamin-C stopped paroxysmal hæmoglobinuria in two patients suffering from -C deficiency. -C inhibits immunohæmolysis by an action on the amboceptor. Ascorbic acid does not influence the amount of complement in blood. A. S.

"Middle part" of complement. F. FERRANTI (Boll. Soc. ital. Biol. sperim., 1937, 12, 645—646).— Fractional pptn. of serum by acetic acid indicates that the "middle part" of the complement is associated with the euglobulin fraction of low isoelectric $p_{\rm H}$. F. O. H.

Non-identity of complement with serumalbumin. F. FERRANTI (Boll. Soc. ital. Biol. sperim., 1937, 12, 646—647).—Fractions of plasmaglobulins produce hæmolysis of sensitised erythrocytes to varying extents. Serum-globulin, however, is inactive. The "end part" of complement is not identical with serum-albumin. F. O. H.

Separation, from the albumin fraction of plasma, of the "end part" of complement by adsorption with fibrinogen. F. FERRANTI (Boll. Soc. ital. Biol. sperim., 1937, 12, 648—649).—The properties of fractions pptd. from plasma by dil. acetic acid indicate that fibrinogen has no complement action but adsorbs some of the "end part" possibly occurring in the albumin fraction. F. O. H.

Anomalies in the titration curves of hæmolytic sera. M. LOURAU (Compt. rend. Soc. Biol., 1938, 127, 133—136).—The anomalies observed in titration with anti-pig sera are due to a special type of linkage of the hæmolysin with the antigen which renders the titration very delicate. H. G. R.

Plasma colloid osmotic pressure as a factor in œdema formation and œdema absorption. A. C. KERKHOF (Ann. intern. Med., 1937, 11, 867— 879).—The normal colloid osmotic pressure of the plasma in man was found by Schade's "oncotic" method to be 21.4 mm. Hg, and in dogs 18.5 mm. In nephrosis, and nephritis with œdema, the pressure averages 8 mm. Intravenous injection of gum acacia may produce a diuresis of water and salt. C. A. K.

New methods of deproteinisation. F. RAPPA-PORT and J. REIFER (Mikrochim. Acta, 1937, 1, 220— 225).—Blood or serum may be deproteinised by pptn. with $Al(OH)_3$, Al tungstate, $Th(OH)_4$, CaF_2 , $Ca_3(PO_4)_2$, or SiO₂. Non-protein-N in the remaining solutions varies with the method of deproteinisation.

J. S. A.

Proteins of hen [blood-]serum. V. CHORINE (Compt. rend. Soc. Biol., 1938, 127, 170—173).— Hen serum contains 34—59 g. per l. of proteins, containing 19.5, 16.6—41.7, and 14—28 g. of albumins, total globulins, and ψ -globulin, respectively. The low val. of the total proteins and the albumin explains the positive Henry's reaction. H. G. R.

Colloidal dimensions, thermodynamic activity, and mean mol. wt. of mixed proteins in blood serum. A. KEYS (J. Physical Chem., 1938, 42, 11—20; cf. A., 1935, 879).—Osmotic pressures of albumin (A) and globulin (G) from human blood serum were measured at 0° at concns. up to 8%. The total osmotic pressure of mixtures is given by f($45\cdot2A + 18\cdot8G$). The val. of f, for which a table is given, increases from 0.88 at 1% to 1.45 at 8% total concn., over which range the relative osmotic activity of the two proteins remains nearly unchanged. Equations are given to represent the relations between the activity coeffs. of proteins and of Cl', protein concn., membrane potential, and gross colloid osmotic pressure. F. L. U.

Osmometric study of gum acacia solutions used for intravenous injection. H. R. BUTT and A. KEYS (J. Physical Chem., 1938, 42, 21-27).-Gum acacia leaks through ordinary membranes impermeable to proteins, but no such leakage occurs in presence of proteins from blood serum. The osmotic pressure of 6% solutions of the gum approximates to that of normal human blood plasma. Intravenous injection of the gum in four cases of liver injury led to a marked increase in the colloid osmotic pressure of the blood serum, persisting for 1-4 days. No significant change in the concn. of albumin or globulin was observed. F. L. U.

Antigenic properties of some azo-compounds of serum-albumin and serum-globulin. M. G. MULINOS, E. SCHLESINGER, and D. B. STEIN (Proc. Soc. Exp. Biol. Med., 1937, 37, 583—587).—Rabbits were immunised with compounds of rabbits' serumproteins with 4-aminoantipyrine or anthranilic acid. Their serum then contained precipitins for the diazo-serum-albumin compounds, but not for those with serum-globulin. Guinea-pig uterus sensitisation experiments gave similar results. V. J. W.

Physico-chemical characterisation of pathological serum-proteins. F. EIRICH and B. SINN-REICH (Biochem. Z., 294, 1937, 61-89).-Measurements of the sedimentation rate, viscosity of plasma and sera, conductivity, p_H, conductivity and viscosity, titration curves, fibrinogen, total protein, and residual N, and albumin-globulin ratio were made on 140 cases of which 19 were normal. The pathological sera fall into 9 groups. In the pathological series marked alterations in viscosity associated with fibrinogen and serum-protein changes were observed; further acid or alkali addition produced greater maximal viscosities than were observable in the normals. Concns. of HCl greater than 0.001N caused marked denaturation of pathological sera. These phenomena were observed in all the pathological sera, but particularly in hepatic disease.

C. C. N. V.

Relationship of group-specific agglutination to the individual serum-protein fractions. M. ROSENMANN (Biochem. Z., 1937, 294, 34–38).— During dialysis of human serum, the group-sp. agglutinins are pptd. along with the hæmolysins in the water-insol. globulin fraction. Salting out by half or one third saturation with $(NH_4)_2SO_4$ and dialysing gives a fraction containing albumins and water-sol. globulin but no agglutinin. Agglutinin is completely extracted by NaCl solution from the waterinsol. globulin. Agglutinin is destroyed by extraction with acetone or with acetone-ether. P. W. C.

Porphyrins and serum-protein. H. GILDE-MEISTER (Z. ges. exp. Med., 1937, 102, 58-87).— Hæmatoporphyrin added to serum *in vitro* or injected intravenously in rabbits combines with albumin, but not with globulin. Hæmatoporphyrin added to fresh blood *in vitro* combines with red cells. Coproporphyrin I and III react with serum *in vitro* like hæmatoporphyrin. Uroporphyrin does not combine with serum-protein. A. S.

Interpretation of post-operative humoral changes. O. LAMBERT and J. DRIESSENS (Compt. rend. Soc. Biol., 1937, 126, 1198—1199).—Following operations there is a decrease in the blood vol. and hæmoconcentration which is attributed to plasma loss and proteolysis. D. T. B.

Composition of depôt serum of the spleen. L. GORECZKY and G. VON LUDÁNY (Biochem. Z., 294, 1937, 104—107).—In the dog, a comparison of circulating blood-serum with that obtained from the spleen shows that in the latter there is an increase in the residual N, protein-N, euglobulin-N, albumin-N, inorg. P, acid-sol. P, and K. The Ca, Na, Cl, and pseudoglobulin-N are the same. C. C. N. V.

Rôle of the spleen in the disappearance of bilirubin from the blood. G. VON LUDÁNY and L. SARKADY (Biochem. Z., 294, 1936, 101—103).—In the dog splenectomy delays the excretion of bilirubin injected intravenously. C. C. N. V.

Form of copper in blood plasma. R. BOYDEN and V. R. POTTER (J. Biol. Chem., 1938, 122, 285— 290).—Cu will not dialyse from plasma which has not been acidified, since it exists in plasma in a dissociable org. form. At $p_{\rm H}$ 1.67 only 46% of the Cu dialyses in presence of HCl compared with 84% in the presence of H₂SO₄. P. G. M.

Copper and iron in human blood. A. SACHS, V. E. LEVINE, and W. O. GRIFFITH (Arch. Int. Med., 1937, 60, 982—989).—The blood of a series of normal boys and girls (14 to 19 years of age) showed the following average vals. per 100 c.c.: Cu $0.1545 \pm$ 0.0088 mg. (boys) and 0.1387 ± 0.0067 mg. (girls); Fe 47.865 ± 2.165 mg. (boys) and 45.375 ± 1.440 mg. (girls); hæmoglobin 14.26 ± 0.608 g. (boys) and 13.61 ± 0.412 g. (girls). The average red cell count was 4.9 million per cu. mm. (boys) and 4.6 million (girls). Blood-Cu and -Fe do not increase after the 15th year in girls, or the 17th year in boys.

T. H. H.

Blood-copper and -iron in Addison's disease. A. SACHS, V. E. LEVINE, and W. O. GRIFFITH (Proc. Soc. Exp. Biol. Med., 1937, 37, 486—487).—In the blood of three patients Cu was found to be slightly above the normal, but the amounts were not correlated with the degree of pigmentation. V. J. W.

Effect of intravenous injection of sodium iodide on the blood-chloride. J. DECOURT, F. EUDEL, and R. CAVIER (Compt. rend. Soc. Biol., 1937, 126, 780—781).—Injection of 1 g. of NaI decreases the blood-Cl', particularly the plasma-Cl'. It is more marked in cases of Graves' disease than in normal subjects. H. G. R. Effect of iodine-iodide treatment on the bloodchloride in Graves' disease. J. DECOURT and R. CAVIER (Compt. rend. Soc. Biol., 1937, 126, 778— 779).—Oral administration of Lugol's solution decreases both the blood-Cl' and the ratio of corpuscular Cl' to plasma-Cl'. H. G. R.

Effect of infra-red rays on blood-chloride and acidosis in extensive burns. O. LAMBERT, J. DRIESSENS, and M. CORNILLOT (Compt. rend. Soc. Biol., 1937, 126, 1200—1201).—Infra-red rays prevent the rise of blood-Cl' and changes of $p_{\rm H}$ in dogs with extensive scalds. D. T. B.

Ultrafilterable and non-ultrafilterable fractions of serum-calcium and -phosphorus in senile cataract. I. POTOP and J. NITZULESCU (Compt. rend. Soc. Biol., 1937, 126, 816-818).--No change was observed in the serum-Ca, but the nonultra-filterable P was decreased. H. G. R.

Blood-phosphorus, -calcium, and -potassium in infectious diseases. A. SLATINEANU, I. BAL-TEANU, I. POTOP, and M. FRANCHE (Compt. rend. Soc. Biol., 1937, 126, 814—916).—In the infectious diseases studied blood-Ca and -K were low.

H. G. R.

Blood-phosphorus, -calcium, and -potassium in pellagra. A. SLATINEANU, I. BALTEANU, I. POTOP, and M. FRANCHE (Compt. rend. Soc. Biol., 1937, 126, 811—813).—K and P (particularly the difference between acid-sol. and inorg. P) are decreased and total and ultrafilterable Ca are increased. H. G. R.

Relation between ionised and total calcium in normal and abnormal sera and their ultrafiltrates. R. S. MORISON, R. MOLEAN, and E. B. JACKSON (J. Biol. Chem., 1938, 122, 439—448).— Total Ca, [Ca''], total ultrafilterable Ca, and total protein were determined on a series of normal and pathological sera. Vals. for [Ca''] agreed satisfactorily with those calc. on the basis of the Ca-protein equilibrium described by McLean and Hastings (A., 1935, 374). In some cases more Ca was found in ultrafiltrates than could be accounted for as Ca''. J. N. A.

Effect of prolan on blood-electrolytes. W. KLODT (Arch. exp. Path. Pharm., 1937, 186, 281— 286).—Injection of prolan into rabbits leads to a rise of serum-Na and a fall of -K and -P, associated with retention of fluid and diminished Na excretion. The effect passes off in a few days even though the prolan injections are continued. T. B. H.

Alkali reserve of tuberculous guinea-pigs. L. RANDOIN, A. RAFFY, and J. AGUIRREZABALA (Compt. rend. Soc. Biol., 1937, **126**, 791—793).—The alkali reserve of oxalated arterial plasma obtained from well-oxygenated blood of tuberculous animals is normal H. G. R.

Continuous measurement of hydrogen-ion concentration and streaming potential in flowing blood. H. HAEUSSLER (Pflügers Archiv, 1937, 239, 143—146).—Streaming potentials can arise in the particular cell used with glass electrode in flowing solutions. The apparatus can, however, be used with blood if precautions are taken to maintain the flow conditions inside the cell const. J. M. R. **Production of acidosis by ammonia.** F. VENULET, F. GOEBEL, and R. TISLOWITZ (Arch. exp. Path. Pharm., 1937, **186**, 218—231).—Drinking NH₃ leads to acidosis, and counteracts the normal alkaline tide after a meal, or the increase of alkaline reserve after administration of bicarbonate. Repeated injections of NH₃ reduce the alkaline reserve and even cause a fall of the blood- $p_{\rm H}$ for about a week, after which compensation sets in. T. B. H.

Micro-method for determination of bloodsugar. E. VINCKE (Klin. Woch., 1937, 16, 882– 885).—The method of Hagedorn and Jensen is compared with that of Miller and Van Slyke; the latter is preferred. F. W. L.

Formation of alcohol during fermentation of blood-sugar and the nature of the plasma sugars. C. DUMAZERT and G. PENET (Compt. rend. Soc. Biol., 1938, 127, 78—80).—The "true" glucose of serum, obtained from the yield of alcohol on fermentation, corresponds with that obtained by a method previously described (A., 1935, 1518).

H. G. R.

Carbohydrate metabolism in sport. F. MEY-THALER (Klin. Woch., 1937, 16, 951—958).—The principal factor influencing the changes in the bloodsugar after running is the condition of athletic training of the subjects. F. W. L.

Modification of the carbohydrate tolerance during diathermic hyperpyrexia. J. MICHEZ (Compt. rend. Soc. Biol., 1937, **126**, 238—239).—A marked hypoglycæmic action, due to some mechanism other than insulin, was observed. H. G. R.

Vitamin-C and blood-sugar. F. ADDARH (Arch. Sci. biol., Napoli, 1937, 23, 399-409).—Vitamin-C has little effect on the blood-sugar of rats and rabbits. In guinea-pigs, particularly when living on dry food, injection of 5 mg. or of 30 mg. produces hyper-glycamia, of 15 mg. hypoglycamia. R. S. CR.

Hyperglycæmic response to transection of mid-brain. J. M. PETERSON and C. W. STARTUP (J. Physiol., 1938, 91, 21—22P).—In dog and eat, decerebration through the superior corpora quadrigemina and below the pituitary body usually results in transitory hyperglycæmia. Adrenaline secretion during the operation is the cause, by direct action on the liver; the response is intensified by ether anæsthesia. In asphyxia adrenaline is again responsible for hyperglycæmia. J. A. C.

Thyroxine, thyrotropic hormone, and parasympathetic. F. HOEGLER and F. ZELL (Z. ges. exp. Med., 1937, 102, 23—31).—The hyperglycæmic action of thyroxine and thyrotropic anterior pituitary hormone is abolished by atropine. A. S.

Præphyson and carbohydrate metabolism. F. HOEGLER and F. ZELL (Z. ges. exp. Med., 1937, 102, 15—22).—Intravenous injection of "præphyson," a prep. from anterior pituitary, produces hyperglycæmia in rabbits. This is prevented by ergotamine, chloral, or veronal. Hyperglycæmia was still observed after extirpation of the cerebral cortex and of the thalamus. A. S. Influence of præhormone on carbohydrate metabolism. F. HOEGLER and F. ZELL (Z. ges. exp. Med., 1937, 102, 8—14).—" Præhormone" (a gonadotropic substance from human pregnancy urine) produces hyperglycæmia in rabbits which can be prevented by chloral, veronal, or ergotamine or extirpation of the basal ganglia. A. S.

Changes in the hyperglycæmic action of adrenaline due to the presence of zinc salts. H. SCHWAB (Compt. rend., 1937, 205, 628-630).— ZnCl₂ (0·15 mg. per kg.) increases the extent (a max. of 250—350 mg. % of glucose) and duration (4 to 6 hr.) of the hyperglycæmic response of fasting rabbits to adrenaline (0·25 mg. per kg.) when both are injected simultaneously and subcutaneously.

J. L. D.

Blood-sugar response to intraperitoneal epinephrine injections in normal and hypophysectomised dogs. P. HEINBECKER and T. E. WEICHSELBAUM (Proc. Soc. Exp. Biol. Med., 1937, 37, 527—529).—Both groups of dogs showed an equal rise in blood-sugar when adrenaline was injected intraperitoneally. V. J. W.

Effect of adrenaline on the blood-platelets and -sugar in insulin shock. E. BENHAMOU, GILLE, and NOUCHY (Compt. rend. Soc. Biol., 1938, 127, 137—139).—Injection of adrenaline causes a transient increase in the val. of the blood-sugar and -platelets which are decreasing after injection of insulin.

H. G. R.

Opposite effects of weak and strong doses of aluminium salts on insulin hypoglycæmia and adrenaline hyperglycæmia. H. SCHWAB (Compt. rend., 1938, 206, 211—213).—In fasting rabbits, subcutaneous administration of insulin (1 unit) in 2 c.c. of 1% gelatin solution containing 3.5 mg. of AlCl₃ produces no hypoglycæmia, whilst if only 0.16 mg. of AlCl₃ is present, the action of the insulin is abnormally prolonged and intense. Similarly the action of adrenaline (0.3 mg. per kg. body-wt.) on fasting rabbits is inhibited by a strong dose of AlCl₃ (0.87 mg. per kg.), but accentuated by a weak dose (0.04 mg. per kg.). W. O. K.

Blood-sugar recovery from insulin hypoglycæmia after section of the splanchnic nerves. B. N. BERG and T. F. ZUCKU (Amer. J. Physiol., 1937, 120, 435-439).—Bilateral section of the splanchnics in cats, which abolishes completely the protection against insulin shock afforded by the normal sympathico-adrenal activity, does not abolish the blood-sugar recovery mechanism. After upper lumbar ganglionectomy normal reactions to insulin were obtained. M. W. G.

Neurological and psychological effects of hypoglycæmia. D. N. PARFITT (Proc. Roy. Soc. Med., 1937, 31, 137—148).—The highest centres suffer first, as in alcoholic intoxication. The main signs are: anxiety, depression and irritability, or excitement and elation; increasing confusion, dullness, and drowsiness; tremor and grimacing; perspiration, pallor, changing pulse rate, and a fall in temp. Ultimately stupor supervenes. Astereognosis, loss of sensory discrimination, and inco-ordination of muscular movements are not uncommon. The neurological appearances which precede coma are described. When recovery is initiated by administration of sugar, there may be a momentary deepening of the coma, but usually recovery occurs rapidly. Amnesia for the coma period and about 1 hr. previously is the rule, with partial amnesia for some time previously. Convulsions which frequently occur are of two kinds: one resembling idiopathic epilepsy, and the other, medullary fits. Slow recovery after administration of sugar is common; in very severe cases even two hr. after the first dose of sugar violent tonic spasms may occur with respiratory distress. A stage resembling concussion may follow. There may be hyperpyrexia. The late symptoms are not due to hypoglycæmia, but are attributed to metabolic W. J. G. disturbances in the brain-cells.

Hypoglycæmia. Study of 404 patients who had no insulin and had this common finding. L. MARTIN, G. HELLMUTH, and M. L. MUTH (Amer. J. digest. Dis. Nutr., 1937, 4, 579—587).—341 patients with a blood-sugar below 70 mg.% and 63 between 70 and 80 mg.% were studied. Definite symptoms due to hypoglycæmia were found in 8.9% (a recognisable organic basis was found in 60% of these); suggestive symptoms in 20% (recognisable organic basis in 43%); no symptoms in 71.1% (organic basis in 24%). The glucose tolerance test showed 3 main varying types of curve. Basal metabolic rate, blood pressure, blood count, non-protein-N, blood-uric acid, gastric analysis, phenolsulphonephthalein test, serum-Ca, P, bicarbonate, cholesterol, or proteins also showed no relation to the groups. A lowered blood-sugar concn. cannot be readily accepted as the cause of the psychoneurotic symptom complex.

C. J. C. B.

Effect of degree of unsaturation of dietary fat on serum-lipins. A. E. HANSEN and W. R. BROWN (J. Nutrition, 1938, 15, 17—22).—A positive correlation existed between the degree of unsaturation of food-fat, depot-fat, and blood-fat in the rat.

S. J. C.

Thyroid and blood-cholesterol in rabbits. K. B. TURNER, C. H. PRESENT, and E. H. BIDWELL (J. Exp. Med., 1938, 67, 111-128).-Thyroidectomy results in an increase of blood-cholesterol of 19% in normal rabbits, 137% in animals with hyperchole-sterolæmia, and 276% in animals resistant to hypercholesterolæmia. A single injection of thyroxine in hypercholesterolæmic rabbits causes a decrease of 40% in the blood-cholesterol with return to normal in 5-9 days: after thyroidectomy the decrease is 61%. Administration of KI before cholesterol feeding prevents the development of hypercholesterolæmia; if given to hypercholesterolæmic animals it further increases the blood-cholesterol by 37% in the intact and 85% in the thyroidectomised animal. A single dose of insulin lowers the blood-cholesterol; the effect is slightly more marked after thyroidectomy.

Å. C. F.

Effect of the thyroid secretion on the quantity of cholesterol esters in the blood. P. BARBIER and H. PÉQUIGNOT (Compt. rend. Soc. Biol., 1938, 127, 111-113).—Hypercholesterolæmia in hypothyroidism is accompanied by a decrease in the free cholesterol and hypocholesterolæmia in hyperthyroidism by a decrease in cholesterol esters.

H. G. R.

Effect of paralysing the parasympathetic on lowering of blood-cholesterol produced by thyrotropic hormone, thyroxine, di-iodotyrosine, and iodothyropeptone. E. FENZ and F. ZELL (Z. ges. exp. Med., 1937, 102, 32-42).—Intravenous injection of thyrotropic anterior pituitary hormone, thyroxine, di-iodotyrosine, and iodothyropeptone in rabbits lowers the blood-cholesterol. This effect is abolished by atropine or by veronal anæsthesia.

A. S. Effect of extracts of the pituitary anterior lobe on the blood-fats. J. M. MUNOZ (Compt. rend. Soc. Biol., 1938, 127, 156—157).—Injection of an alkaline extract of the anterior lobe increases the blood-fatty acids, -cholesterol, and -phospholipins, in the absence of the thyroid, pancreas, testes, ovaries, adrenal medulla, and the splanchnic nerves, and is not caused by extracts of other organs. H. G. R.

Increase in blood-ketones by pituitary anterior lobe extract. C. T. RIETTI (Compt. rend. Soc. Biol., 1938, 127, 154—155).—Injection of an alkaline extract of the anterior lobe increases the bloodketones, after section of the splanchnic nerves, and after extirpation of the thyroid or adrenal medulla. This increase was not observed after injection of extracts of other organs. H. G. R.

Unsaturated fatty acids of the blood during pregnancy and parturition. O. MÜHLBOCK (Klin. Woch., 1937, 16, 853—854).—The average I vals. in mg. per 100 c.c. of the blood and sera of healthy non-pregnant subjects were: 20—30 years, 457; 30—40, 529; 40—50, 558. The vals. decreased between 60 and 70 years. During pregnancy the vals. increased from the 4th month, being highest immediately ante-partum. Post-partum the vals. were high for the first 6 days. Blood from the umbilical cord gave lower figures than the maternal.

F. W. L.

Do androgens affect blood-lipins? C. D. KOCHARIAN, P. L. MCLACHLAN, and H. D. MCEWEN (J. Biol. Chem., 1938, 122, 433—438).—Injection of androstenedione, testosteroneoxime, and testosterone benzoate into a thin castrate, a fat castrate, and a normal dog had no immediate or delayed effect on the amounts of cholesterol, phospholipin, neutral fat, and total lipin in the blood-plasma. There was no relation between duration of castration or diet and the level of plasma-lipins, but the level was dependent on the nutritive state of the animal. J. N. A.

Formation of ketones from fatty foods. S. MARKS (Klin. Woch., 1937, 16, 841—843).—After the introduction of fatty foods into the duodenum of healthy adults the blood-ketones increased without ketonuria; they begin to diminish after about 3 hr. Injection of 1 mg. of adrenaline $\frac{1}{2}$ hr. after the fat administration increased the ketonæmia. F. W. L.

Blood-cholesterol in rabbits after ingestion of carbon tetrachloride. P. DERVILLÉE, R. CAS-TAGNOU, and F. CHOMEREAU-LAMOTTE (Compt. rend. Soc. Biol., 1938, **127**, 61—63).—Carbon tetrachloride in rabbits raised the blood-cholesterol from the 3rd to the 5th day. D. T. B.

Carotene and vitamin-A (A) in pregnancy blood, (B) in umbilical cow blood. G. GAEHTGENS (Klin. Woch., 1937, 16, 893—894, 894—895).—(A) In a high percentage of cases there is a complete absence of vitamin-A in the serum during pregnancy and the average val. is less than in non-gravid females. The diminution is due to transference to the foctal circulation and to urinary excretion. The concn. of carotene is either normal or slightly increased.

(B) In the foctal blood small amounts of carotene can be recognised and in isolated cases very slight amounts of -A. The vals are much below those of maternal blood. F. W. L.

Analysis of provitamin-A in blood-serum. A. G. VAN VEEN and J. C. LANZING (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 779-784).-Blood is saponified with 60% aq. KOH and the product extracted with light petroleum. The extract is washed with water, dried, and poured through a column of Al2O3 previously moistened with petroleum. The coloured bands of adsorbed carotenoids are compared with those obtained with standard solutions. $0.5 \ \mu g$. of α - or β -carotene or cryptoxanthene may thus be detected. With the blood of native Javanese the uniformity of the chromatograms reflects the uniformity of the diet, which contains provitamin-A but no true vitamin-A. α -Carotene is usually absent from the blood; β -carotene is present in small and cryptoxanthene in fairly large amounts. The diet of Europeans usually contains much true vitamin-A and the level of α - and β -carotene in blood is low. The true vitamin-A content of blood is similar in Javanese A. G. P. and Europeans.

Methylene-blue micro-method for determination of serum ascorbic acid. A. ELMBY and T. K. WITH (Klin. Woch., 1937, 16, 746—748).—By a modification of Lund and Lieck's method for 0.06-0.1 c.c. of serum, employing a droplet measurement for titration, $0.2 \ \mu$ g. of ascorbic acid in 1 c.c. of solution can be detected; $0.2 \ \text{mg.-\%}$ of ascorbic acid can be determined in 0.06 c.c. of serum. F. W. L.

Treatment with ascorbic acid of the plasma of a fowl affected by erythroblastosis. E. MORELLI and A. VERCELLONE (Nature, 1938, 141, 202—203).—Addition of ascorbic acid to the plasma of a fowl with erythroblastosis causes a ppt. Injection of the supernatant liquid into another fowl reproduces the disease; the ppt., dissolved in aq. NaCl, has no effect. C. A. K.

Determination of the vitamin-D content of blood-serum. J. WARKANY (Biochem. Z., 1937, 293, 415—426).—The biological method was successfully applied to estimate vitamin-D in the blood of a variety of animals and of man. Hypervitaminosis-D under pathological conditions can be thus determined. P. W. C.

Polypeptidæmia in dogs. M. BURSTEIN (J. Physiol. Path. gén., 1937, 35, 71—80).—Polypeptides were determined as the ppt. obtained with phosphotungstic acid in the trichloroacetic acid filtrate. After intravenous injection, polypeptides were increased in the blood for a few hr. A little appeared in the urine, but most was taken up by the tissues (chiefly liver) and some was destroyed in the lungs. None appeared in the cerebrospinal fluid, and no serious effects followed its introduction into the cerebrospinal fluid or into the blood. C. A. A.

Polypeptide-nitrogen of blood. I. Distribution between blood-serum and corpuscles under normal conditions. II. Blood-polypeptide in liver disease. III. Blood-polypeptide in wasting diseases. IV. Blood-polypeptide in renal disease. P. LARIZZA (Arch. exp. Path. Pharm., 1937, 186, 232—246, 247—254, 255—261, 262—268). —I. The polypeptide content of the blood, as indicating the N still precipitable in the trichloroacetic and phosphotungstic filtrate, is unequally distributed between corpuscles and plasma, corpuscles containing 7.02 mg.% and the serum 2.21 mg.%. These figures are equiv. to 13% and 7.24%, respectively, of the total residual N. Of this residual N 7.5% in the serum and 30.5% in the corpuscles is unaccounted for by urea, uric acid, amino-acid, creatine, or creatinine.

II. There is no special association between cirrhosis and other diseases of the liver and an increase in blood-polypeptides. Such increase is found in hepatic congestion from cardiac failure and in liver carcinoma, but is attributed to increased endogenous protein metabolism.

III. Blood-polypeptides are increased in any clinical condition associated with increased wasting of tissues, of which it may serve as a measure. Polypeptide in the blood is regarded as a waste product of tissue metabolism, which is only slowly eliminated by the kidney.

IV. In renal disease the polypeptides of the blood are increased, together with the residual N, as a retention phenomenon. It has no special association with uræmic symptoms. The polypeptide increase involves both corpuscles and serum. T. B. H.

Amino-acid content of the blood following intravenous injection of hydrolysed casein. R. ELMAN (Proc. Soc. Exp. Biol. Med., 1937, 37, 437— 440).—Hydrolysed casein solution amounting to $3\cdot5\%$ of the body-wt. was injected either in one massive dose or at a rate of $0\cdot2$ c.c. per kg. per min. In the first case the blood amino-acids after an initial rise did not return to normal for $2\frac{1}{2}$ hr. and in the second case returned to normal in 45 min. after the end of the injection. V. J. W.

Changes in the amount of amino-acids in the blood of normal and injured rabbits following intravenous injection of amino-acids. I. KITA-MURA (Jap. J. Gastroenterol., 1937, 9, 166–183).— In normal rabbits starved for 14 hr. the average blood-amino-acid-N by Folin's colorimetric method was 7.9 mg.%. In normal rabbits injected intravenously with 7 mg. per kg. body-wt. of glycine, *d*-alanine, *dl*-serine, glutamic acid, or *l*-tyrosine, the blood-amino-acid-N level rose to a max. 5 min. after administration and fell to normal in 30–60 min. In rabbits, the day after poisoning by subcutaneous injections of chloroform (20% in olive oil), or of carbon tetrachloride, the average blood-amino-acid-N was $12\cdot 2 \text{ mg.}\%$. When they were given the various amino-acids, the blood-amino-acid-N rose to a max. in 5 min., but remained at that level, or in the case of *l*-tyrosine even increased, during the next 4 hr. Rabbits with double nephrectomy showed no change in the blood-amino-acid-N over 3 days. On administering the amino-acids they reacted in a similar way to normal rabbits. C. J. C. B.

Partition of urea in the blood. E. M. BOYD and R. B. MURRAY (J. Lab. clin. Med., 1937, 22, 1232— 1236).—K, NH₄, and Na oxalate, and Na citrate decrease the urea content of the red cells and increase the urea content of the plasma. In defibrinated, heparinised, and hirudinised blood the urea content of the plasma differs from that of the cells, but not consistently in one direction. T. H. H.

Purine content of serum in health and disease. J. WEBER and W. SCHULER (Z. ges. exp. Med., 1937, 102, 45-57).—After 3 days of a purine-free diet the serum-uric acid in normal subjects was 2.5— 3.5 mg.% Exogenous nucleo-proteins raise the uric acid more rapidly in serum than in blood. Increased serum-uric acid was found in patients with leukamia, malignant growth, Graves' disease, and other diseases. A. S.

Guanidine-like substances in blood. I. Colorimetric determination and normal values. J. E. ANDES and V. C. MYERS. II. Blood-guanidine in nitrogen retention and hypertension. J. E. ANDES, C. R. LINEGAR, and V. C. MYERS (J. Lab. clin. Med., 1937, 22, 1147—1154, 1209—1216).— I. A modification of Pfiffner and Myers' method for the colorimetric determination of guanidine bases in blood is described. The average concn. of guanidinelike substances in 100 c.c. of whole blood of 26 normal individuals was in males 0.25 mg. and in females 0.23 mg.

II. Blood-guanidine in patients with N retention from renal insufficiency followed closely the degree of azotæmia, as measured by the vals. for blood-urea and -creatinine. There was no direct relationship between the degree of hypertension and blood-guanidine concn. T. H. H.

Normal blood-histamine of laboratory animals. I. MARCOU and N. GINGOLD (Compt. rend. Soc. Biol., 1937, 126, 724—726).—Considerable variations were observed in the total blood-histamine and in the ratio of plasma- to corpuscle-histamine between the different species. H. G. R.

Extraction of adrenaline from whole blood, red cells, and plasma and its application to the determination of adrenaline. A. CAHEN (Compt. rend. Soc. Biol., 1938, **127**, 221—224).—Deproteinisation of blood by trichloroacetic acid causes loss of adrenaline by adsorption on the cell proteins. If the time of contact is not longer than 10—15 min., at least 90% of the adrenaline added to the blood will be found in the plasma. H. G. R.

Determination in the plasma of free acetylcholine of the blood. E. KAHANE and J. LÉVY (Compt. rend. Soc. Biol., 1938, **127**, 10-11).--Acetylcholine is present solely in the plasma and may be determined after centrifuging blood treated with F' and eserine (to inhibit the esterase). H. G. R.

Blood-catalase in experimental pyrexia and fever in man. I. SOLAROLI (Arch. Fisiol., 1937, 37, 69-96).-The amount of catalase in rabbit's blood, determined by Barelli's method, was greatly increased during hyperpyrexia induced by intravenous injection of dialysed yeast. The same was found in the blood of man during the febrile attacks of therapeutically induced malaria in tabes or dementia paralytica. The amount of catalase increased very rapidly in the initial stage, before any actual rise of temp. had taken place; it reached a max. at the fastigium, and very rapidly decreased during the defervescence. It is suggested that in fever there is an increased formation of catalase, representing a biochemical reaction of the organism, associated with but not simply dependent on the rise of temp. G. S.

Ultra-violet absorption of blood ultrafiltrate. G. FLORENCE and A. DRILHON (Compt. rend., 1938, 206, 214—216).—Whereas normal human serum shows two absorption bands in the ultra-violet at about 2790 and 2550 A., the ultrafiltrate (through a Cellophane membrane) shows bands at 2900 and 2650 A.

W. O. K.

Existence of a substance in the blood, which promotes the detoxicating function of the liver, during renal disturbances. K. MURAKAMI (Jap. J. Gastroenterol., 1937, 9, 184-192).-Serum-protein from patients with chronic nephritis, normal rabbits, or rabbits after extirpation of both kidneys, with cantharidin or U nitrate nephritis was pptd. by Folin's method and extracted with alcohol and then ether. The extracts and residue were injected intravenously into rabbits without kidneys, and 30 min. later the liver was removed, irrigated with its own blood, and the rate of disappearance of Na salicylate or santonin added to the perfusion fluid noted. Both substances were more rapidly removed in the animals injected with alcohol or ether extracts from nephritic patients or rabbits than in controls injected with extracts from normal rabbits. The residue injections had no effects. Similar results were found when the perfused livers came from rabbits poisoned by P two days C. J. C. B. before.

Takata reaction and pilocarpine uptake of serum. F. HAHN (Z. ges. exp. Med., 1937, 102, 121-126).—The less albumin serum contains the less I is required to ppt. pilocarpine. The total amount of protein and the amount of globulin do not influence the pptn. of pilocarpine from serum by I. A. S.

Isolation of an oxidising factor from normal and cancer blood. Deficiency of the factor in cancer blood. E. ROUSSEAU (Compt. rend., 1937, 205, 1101—1103).—The dried blood of cancer patients extracted with ether and alcohol leaves a residue with less than normal oxidising power towards methylene-blue decolorised with aq. $Na_2S_2O_4$. This oxidising factor is thermolabile. A. L.

Differential reactions between the blood or urine of cancerous and normal subjects. E. ROUSSEAU (Compt. rend., 1938, 206, 216-217).----The dried blood is repeatedly extracted under exact

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conditions with trichloroacetic acid, and the combined extracts are dialysed and evaporated to dryness in vac. The extract (0.01 g.) is then heated on the water-bath with 2 c.c. of water and 6 drops of HCl, 6 more drops being added after 10 min. After 1 hr. the liquid contains in the case of blood from cancerous patients a dense, brown, but in the case of normal blood only a light, white ppt. W. O. K.

Digitalis diuresis and certain blood-serum characteristics. J. H. DEFANDORF (J. Lab. clin. Med., 1937, 22, 1237—1239).—Intravenous administration of 50 mg. of digitalis per kg. to anæsthetised cats and dogs produced no significant changes in total Ca, inorg. P, surface tension, or viscosity of the blood-serum. T. H. H.

Effect of experimental stasis in lymphatic channels on the lymphocyte content, with special reference to plasma cells. H. E. JORDAN and C. B. MORTON (Amer. J. Anat., 1937, 61, 407— 428).—Two ligatures were placed 5 mm. apart at the lower end of the thoracic duct in the dog to confine a collection of lymphocytes in a blind pocket for periods varying from 1 to 10 days. Similar procedures were followed on mesenteric lymphatics, and at intervals the lymphatics and the neighbouring glands were removed for histological study. In the regions of lymph stasis lymphocytes were transformed into plasma cells. The morphology of the various blood cells is discussed. H. A. HA.

Isolated lymphatic capillaries in the living mammal. E. R. CLARK and E. L. CLARK (Amer. J. Anat., 1937, 62, 59—92).—Regenerating and new lymphatics frequently become separated secondarily from their connexions. Such an isolated lymphatic may persist for 18 months or may be reincorporated in the lymphatic system by union with new sprouts from other regenerated lymphatics. No new lymphatics arose by the transformation of mesenchyme cells into endothelium. H. A. HA.

(c) VASCULAR SYSTEM.

Comparison of the rhythmic capacity of the auricle and ventricle, and dependence of mechanical latent period of the ventricle on frequency and strength of stimulation. M. NUSSBAUM Pflügers Archiv, 1937, 239, 21-40).—The frog's auricle responds to stimuli at shorter intervals (about 0.5 sec. at $18-22^{\circ}$) than the ventricle (about 1.5sec.); when the interval is decreased below the crit. val., various abnormal types of contractions occur. The crit. interval is not const., but depends on the strength and duration of rhythmic stimulation. At high rates of stimulation the auricle fibrillated and showed irregular contractions, whilst the ventricle usually showed slow and comparatively regular contractions; the rate of contraction was greatly affected by the strength of the stimuli. J. M. R.

Rhythm and periodicity, with special reference to the movements of the heart and of medusæ. A. BETHE (Pflügers Archiv, 1937, 239, 41-73).—Rhythm is regarded as one of the basic properties of excitable tissues. When not occurring spontaneously it can be demonstrated by changing

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the environment or by rhythmic stimulation. The various types of abnormalities in contractions which occur when the rate and strength of stimulation are varied are described and discussed, as well as the nature and co-ordination of rhythmic contractions. J. M. R.

Humoral control of cardiac tissue. H. HER-MANN, P. CORNUT, and J. B. GUIRAN (J. Physiol. Path. gén., 1937, 35, 11—29).—The isolated left auricle of the rabbit in Ringer–Locke solution at 37° beats with the same rhythm as in the intact animal, interrupted occasionally by quiescent periods which may be due to asphyxia. This prep. responds to adrenaline and other drugs and tissue extracts in the absence of nodal tissue; a humoral theory for the regulation of the beat is contra-indicated.

C. A. A.

Secondary refractory period of cardiac in-hibitory mechanism. H. FREDERICQ (Compt. rend Soc. Biol., 1937, 126, 239-242).-The inotropic summation of two supra-maximal stimuli (condenser discharges) applied to the vagus nerve was investigated in the tortoise auricle. The stimulus interval varied up to 60 sec. The % difference between the effects of single and paired stimuli was studied in function of intervals. Different modalities of summation were shown in 7 separate periods on the curve: (1) abs. refractory period (primary) (6.5-8 m.sec.); (2) period of increasing summation (8-50 m.-sec.); (3) perfect summation (50-150 m.-sec.); (4) decreasing summation (1.5-2 sec.); (5) abs. refractory period (2-8 sec.); (6) increasing summation (up to 25-45 sec.); (7) the second stimulus gave an effect equal to that of the first. In (5) the nerve trunk is not refractory. Failure of summation is attributed to some process in the cardiac muscle.

D. T. B. Summation in the tortoise of inotropic cardiac effects of separate stimuli to both vagi. H. FREDERICQ (Compt. rend. Soc. Biol., 1937, 126, 243). —Inotropic effects were studied in the right auricle of the tortoise. The application of one stimulus to one vagus and the second to the other showed no primary abs. refractory period in the heart for intervals of a few m.sec., and no secondary refractory period for intervals of a few sec. The two vagi are distributed to separate areas for liberation of acetylcholine.

D. T. B.

Mechanism of occurrence of "secondary refractory period" in cardiac vagus of tortoise. H. FREDERICQ (Compt. rend. Soc. Biol., 1937, 126, 1234—1236).—The secondary refractory period in summation of two vagal stimuli (see preceding abstracts) is due to accumulation of the choline derived from breakdown of the acetylcholine liberated by the first stimulus, which annuls the action of the acetylcholine liberated by the second stimulus.

D. T. B.

Return to normal heart rate after vagus stimulation. R. BRÜCKNER (Arch. int. Physiol., 1937, 45, 358—381).—Studies by means of Fleisch's time-writer on 25 cats and 21 hares showed that only rarely is the return to normal a continuous process. In a few cases adrenaline is produced, apparently reflexly from the vasosensory areas. If eserine is given there is a stage of sudden increase in the rate after the vagal stimulation ("inflexion physostigmique"), possibly due to sudden cessation of action by acetylcholine at the sino-auricular node. In failing hearts alternating and missed beats appeared.

C. E. B.

Rate and force of heart-muscle contraction. V. KRUTA (Arch. int. Physiol., 1937, 45, 332—357).— Isolated left auricles of guinea-pigs were stimulated electrically in thermostatically controlled baths of oxygenated Ringer's solution. After rest the preps. pass through a short stage of initial contractions ("contractions d'entrée"), decreasing in size, and a second longer phase of stepwise contractions to a steady contraction. In this steady state two types of contraction may be shown: (1) where the amplitude decreases with acceleration, and (2) where the amplitude increases with the rate up to a certain limit. The max. and min. durations of contraction occur at lower frequencies than the max. and min. amplitudes.

C. E. B.

Cardiac acceleration in the sympathectomised dog. L. BROUKA, D. B. DILL, and S. J. G. NOWAK (Compt. rend. Soc. Biol., 1937, **126**, 909—910).— 3 weeks after sympathectomy in the dog cardiac acceleration can be induced by muscular work, emotion, or paralysis of the vagi. D. T. B.

Hæmodynamic studies in experimental coronary occlusion. IV. Stellate ganglionectomy experiments. G. SCHAUER, L. GROSS, and L. BLUM (Amer. Heart J., 1938, 14, 669-676).-Stellate ganglionectomy diminished the incidence of ventricular fibrillation and immediate mortality rate which follow the ligature of the anterior descending coronary artery in the dog. C. A. K.

Quantitative method for determining the activity of autonomic nerves supplying the heart. L. SEEKLES (Z. ges. exp. Med., 1937, 102, 94—101).—Heart rate was studied during several min. following intravenous injection of 2 mg. of adrenaline in adult cattle. Parasympathetic tone is increased during pregnancy and in experimental or pathological hypocalcæmia. A. S.

Bradycardia in catarrhal icterus. M. DU-MITRESCO-MANTE (J. Physiol. Path. gén., 1937, 35, 114—121).—20 cases with icteric bradycardia received doses of atropine up to 4 mg. Acceleration of the heart (confirmed by electrocardiagram) suggested that the syndrome was nervous in origin. On the other hand injection of bile salts into the monkey led to a tachycardia, after a short bradycardia. C. A. A.

Action of acetylcholine on the molluscan heart. Antagonism of curare and acetylcholine. A. JULLIEN and D. VINCENT (Compt. rend., 1938, 206, 209—211).—Although in most molluscs the effect of acetylcholine on the heart is to produce an arrest in diastole, in *Mytilus galloprovincialis* it produces a contraction lasting for some time, according to the dose. The antagonistic action of curare and acetylcholine is marked in the case of *Murex trunculus*, but is scarcely noticeable with *Mytilus* and *Aplysia*.

W. O. K.

Restoration by drugs of tone and automatism in an exhausted heart. J. DUTANT (Compt. rend. Soc. Biol., 1937, 126, 1130—1132).—Atropine, guanidine, acetylcholine, eserine, BaCl₂, and MgCl₂ restore tone and activity to an exhausted heart several days old; with higher conces. tone alone is restored. D. T. B.

Effect of Staphylococcus aureus exotoxin on the rabbit heart. J. H. DINGLE, H. E. HOFF, L. H. NAHUM, and B. W. CAREY, jun. (J. Pharm. Exp. Ther., 1937, 61, 121—129).—The exotoxin of S. aureus (0.5-0.062 c.c. per kg.), injected intravenously into rabbits, caused death in $1\frac{1}{2}$ —20 min. Electrocardiographic records showed various cardiac irregularities and, in every experiment, changes characteristic of severe myocardial damage, which were the cause of death. E. M. S.

Cardiac output in heart disease. J. MCGUIRE, V. HAUENSTEIN, and R. SHORE (Arch. Int. Med., 1937, 60, 1034—1042).—The cardiac output as determined by the direct Fick method and the modified Grollman acetylene method was subnormal in 6 patients with heart disease. There was no relationship between the severity of symptoms and the cardiac output.

T. H. H. Cardiac output. E. H. CHRISTENSEN (Ergebn. Physiol., 1937, 39, 348-407).—A review. W. McC.

Standardisation of precordial leads. CARDIAO SOCIETY OF GREAT BRITAIN AND IRELAND and AMERICAN HEART ASSOCIATION (Lancet, 1938, 234, 221—222).—It is recommended that the precordial lead be placed at the extreme outer border of the apex beat as determined by palpation. The other lead may be taken from the left interscapular region (lead IV), the right arm (lead IVR), the left arm (lead IVL), or from a point connected through 5000 ohm resistances to the three extremities (lead IVT). Leads IVR and IVL are suggested for all ordinary purposes.

Ĉ. A. K.

Electrocardiographic changes following external chest injury to dogs. R. W. KISSANE, R. S. FIDLER, and R. A. KOONS (Ann. intern. Med., 1937, 11, 907—935).—Blows of varying severity were applied to the chest wall of 15 dogs under Na amytal anæsthesia. The electrocardiogram showed changes in RS and T waves and arrhythmias, which were not related to the extent or degree of the injuries to thoracic structures. C. A. K.

Significance of precordial leads in electrocardiagraphy in acute myocarditis. V. MOR-TENSEN (Acta med. scand., 1937, 93, 350—358).— In two cases of acute myocarditis, due to undulant fever and influenza, the use of precordial leads (4th left intercostal space to left leg and apex to left leg) gave more definite indications of heart changes than the usual limb leads. In one of these cases, inversion of the T wave was the only definite sign and persisted for some time after the limb leads had become normal. Interpretation of auricular fibrillation in the electrocardiogram. E. DE SOMER (Cardiologia, 1937, 1, 335-348).—The zero line of the electrocardiogram shows oscillations which do not depend on the activity of the heart. They are produced by respiratory movements and can easily be mistaken for auricular flutter or fibrillation. A. S.

Physiological irregularities of cardiac activity. V. G. SCHLOMKA and G. SCHMITZ (Z. Kreislaufforsch., 1938, 30, 41—54).—In 60% of cardiac cases during inspiration there is right axis deviation of the electrocardiogram, in 20% left axis deviation, and in 20% no change. The deviation is attributed to increased pulmonary arterial pressure. A. S.

Paroxysmal change of heart rhythm. P. ECKEY, A. GUENZEL, and H. W. WUENSCHE (Dtsch. med. Wschr., 1938, 64, 109—112).—17 patients with paroxysmal changes from sinus to nodal heart rhythm were observed. Coronary insufficiency, particularly during effort, is held responsible for the condition. A. S.

Significance of size of waves of the electrocardiogram. T. VIZER (Dtsch. med. Wschr., 1938, 64, 121-122).—The ventricular complex of the electrocardiogram is larger in subjects doing much exercise and smaller in cases with fibrosis of the heart. The size of the waves depends on the work of the heart. A. S.

Electrocardiographic changes in the dog following sudden occlusion of the left anterior descending coronary branch. L. GROSS and B. CALEF (Amer. Heart J., 1938, 14, 677-683).— Sudden occlusion of the left anterior descending coronary artery in the dog produced the following electrocardiographic changes : upward deviation of R-T segment in lead I, and downward deviation in leads II and III; rhythmic abnormalities ranging from single ectopic beats to ventricular fibrillation.

C. A. K.

High coronary deviation of T in dogs. C. PEZZI, A. DEFRISE, and G. AGOSTONI (Arch. Mal. Cœur, 1937, 30, 929-945).-A high coronary deviation of T in the electrocardiogram, as described by Smith and Pardee, was observed in dogs only when an intense ischæmia was produced at the apex of the heart, either by tying the branches of the coronary artery supplying the apex or by painting the apex with I. Denervation of the coronary artery or a subsequent intravenous injection of ethylenediamine abolished the coronary T in the electrocardiogram produced by I. The I vasoconstriction was not abolished by extirpation of the stellata ganglia or cutting the preganglionic fibres of the thoracic sympathetic. The disappearance of the coronary Twave resulting from I is the only reliable test for substances producing vasodilatation of the coronary arteries. A. S.

Loss of potassium from embryonic chick hearts in potassium-free media with and without calcium. E. WATCHORN and P. D. F. MURRAY (Proc. Roy. Soc., 1938, B, 124, 446-450).—Hearts of $2\frac{1}{2}$ -3 day chick embryos bathed in NaCl were found to lose K. K is also lost in NaCl + CaCl₂.

Loss of K is less rapid if Ca is present than if it is absent. F. B. P.

Control of beating and micro-fibrillation by means of potassium, calcium, and sodium in the chick embryo heart. Calcium fibrillation and the control of beating. P. D. F. MURRAY (Proc. Roy. Soc., 1938, B, 124, 421-446).-In most experiments, two or three solutions were used consecutively in order to examine the effect of each on hearts previously treated with various other solutions. The influence of Ca and K in the medium on the beating of the heart depends on the balance between the two ratios : Ca at the cell surface/K in the cell interior, and K at the cell surface/K in the cell interior, but the ratio between Ca at the cell surface and K at the cell surface is without influence, except indirectly by altering the balance of the two effective ratios. Relative increase of superficial Ca over internal K stimulates beating; if the increase is too great, it stops beating and fibrillation is induced. Decrease of this ratio depresses or stops beating. Increase of superficial K relative to internal K F. B. P. depresses beating.

Relation of blood-calcium to duration of systole. A. GÜNZEL (Arch. exp. Path. Pharm., 1937, 186, 313-325).—In human tetany and in experimental hypercalcæmia there is a close relationship between the level of blood-Ca and the duration of the S-T interval in the electrocardiogram, so that one may be used as a measure of the other.

T. B. H.

Histamine content of the heart. M. ISHIHARA and T. IWAO (Arch. exp. Path. Pharm., 1937, 188, 110—113).—Histamine was determined colorimetrically by Yokohama's modification of Hanke and Koessler's method. In the ox the histamine content of various sections of the heart diminished in the order : sino-auricular node, endocardium, left, right auricle, left, right ventricle from 31.8 to 9.6 mg. per kg. In the dog and rabbit the auricles contained more histamine than the ventricles. It is alleged that during perfusion with Ringer's solution the histamine content diminished, but no data are given. H. O. S.

Effect of hydrogen-ion concentration of blood on the gaseous metabolism of the heart. K. GOLLWITZER-MEIER, H. HAEUSSLER, and E. KRÜGER (Pflügers Archiv, 1937, 239, 120—130).—Increase in [H'] of arterial coronary blood decreases the gaseous metabolism of the heart (dog's heart lung prep.), and vice versa; the alterations in gaseous metabolism are only partly due to changes in the cardiac work and frequency. Increase in [H'] of arterial blood increases the efficiency of the heart, and vice versa. The adaptation of the diastolic vol. and of the O₂ consumption to increase of the work of the heart is independent of the reaction of the blood.

J. M. R.

Identification of the receptor areas in the venæ cavæ and pulmonary veins which initiate reflex cardiac acceleration (Bainbridge's reflex). J. F. NONIDEZ (Amer. J. Anat., 1937, 61, 203—232). —Receptor areas containing numerous nerve endings were found in the intrapericardial portions of the venæ cavæ and pulmonary veins of the cat, dog, and rabbit. Afferent arborisations also occur in the wall of the coronary sinus near its entrance into the right atrium. Two types of nerve endings were observed : (i) subendothelial terminations in the veins which are presso-receptors; (ii) perimuscular arborisations in the walls of the pulmonary veins, in the longitudinal musculature of the superior vena cava, and in the sino-atrial node. The function of the latter is unknown. H. A. HA.

Pulmonary vessels with striated fibres in small mammals. A. GUIEYSSE-PELLISSIER (Compt. rend., 1937, 205, 1176—1177).—The walls of the pulmonary vessels of the dormouse, weasel, and bat contain striated muscle fibres, whereas those of the guinea-pig (except occasionally), hedgehog, and ferret do not. The striated muscle constitutes a sleeve directly continuous with the left auricular muscle; it is not found in the pulmonary capillaries. J. L. D.

Intra-epithelial vascularisation in the human lip. V. JANKO (Z. mikr.-anat. Forsch., 1937, 42, 116—123).—Photomicrographs of blood capillary loops are shown devoid of accompanying connective tissue surrounded by the succulent epithelial cells of the thick epidermis of the torus labialis of the mouth of a 7 months foetus and of a new-born child. The findings are compared with similar ones mostly in thick epithelium of body orifices where transition of epithelial type occurs. The condition is attributed to inclusion of capillaries by excessive growth of epithelium; to facilitate its nutrition in the infant lip it may subserve suckling in some manner. J. H. G.

Relation of the presso-receptor nerves to the somatic nervous system. A. SCHWEITZER (Cardiologia, 1937, 1, 349—365).—A review. A. S.

Control of circulation in health and disease. J. LINDHARD (Cardiologia, 1937, 1, 366—384).—A review. A. S.

La Piézographie directe et instantanée. D. M. GOMEZ and A. LANGEVIN (Hermann et Cie., Paris, 1937, 30 pp.).-A brief review is given of methods used for making continuous blood pressure tracings, followed by a detailed account of the design, construction, and use of a new instrument, the "piézographe." With it the pressure variation in the vessel under investigation is transmitted through the vessel wall to a piece of piezo-electric quartz. The electrical charge developed on the quartz, with compression in a direction perpendicular to the optical axis, operates an electrometer valve and amplifier with recording oscillograph. Tracings obtained with the piezograph are compared with sphygmographic records taken simultaneously. Measurements on an artificial hydrodynamical system are described.

W. F. F.

Determination of arterial resistance in man. A. BÖGER and K. WEZLER (Arch. exp. Path. Pharm., 1937, 186, 42—56).—A new mathematical basis for the calculation of total arterial resistance, from the blood-pressure and pulse-wave. T. B. H.

Elasticity of human peripheral vessels. W. LENT (Z. Kreislaufforsch., 1938, 30, 55-65).—The rate of propagation of the pulse wave is the same in the paralysed leg as in the contralateral normal leg of the patient. The elasticity of the femoral artery is not impaired in hypertony or in old age. A. S.

Maintenance of tone in medium and small arteries. J. MALMÉJAC and JONESCO (Compt. rend. Soc. Biol., 1938, 127, 83-85). D. T. B.

Peripheral vasomotor reactions. J. MAL-MÉJAC and V. DONNET (Compt. rend. Soc. Biol., 1938, 127, 86—88).—Plethysmography of the dog's limb reveals extreme localisation of the peripheral vasomotor reflexes previously described. D. T. B.

Carotid sinus reflexes after sympathectomy. Z. M. BACQ, F. BREMER, L. BROUHA, and C. HEYMANS (Compt. rend. Soc. Biol., 1937, **126**, 1261—1263).— Non-anæsthetised sympathectomised cats show carotid sinus reflexes. Previous failures are attributed to anæsthetics or to low blood pressure. D. T. B.

Normal and interrupted vascular patterns in the intestinal mesentery of the rat. Experimental study on collateral circulation. H. B. WEYRAUCH and C. F. DE GARIS (Amer. J. Anat., 1937, 61, 343-372).-The pattern of the mesenteric arteries of the small intestine was studied in normal and in operated rats in which certain branches of the main artery were ligated. Following ligature of the arterial arches new anastomotic circulations developed and formed new arches. In the new collaterals increase of the lumen, of the thickness of the walls, and of the length of the vessels was traced. In one series of animals three fourths of the gut arteries were occluded without ill-effect. There was no evidence that the vasa vasorum contributed to the collateral circulation. The hæmodynamics are discussed.

H. A. HA.

Pulsatile movements in the pulmonary artery recorded with X-ray kymogram ("flachenkymogram"). K. HECKMANN (Klin. Woch., 1937, 16, 733—736).—A discussion of the factors which influence the pulsations in the region of the pulmonary artery and the modifications produced in the border crenellation of the kymogram. F. W. L.

Isolated rabbit's head preparation for the study of cervical sympathetic and cephalic vascular reactions. M. WIERZUCHOWSKI (Arch. int. Pharmacodyn., 1938, 58, 47–60).—A 4-way cannula with accessory apparatus for perfusion of the isolated head of the rabbit is described. The action of the cervical sympathetic and of drugs on the vascular tone has been recorded. D. T. B.

Capacity of the vascular bed in dogs. A. KLISTECKI and M. SZABUNTEWICZ (Acta Biol. Exp., 1937, 11, 111—112).—The % capacity of the bloodvessels of the dog is : head and neck 14, fore-legs 10, hind-legs with pelvis 15.5, lungs 10, abdominal viscera 46.6, and heart with aorta 4. A comparison of these capacities with the rate of flow of blood in these regions shows that the intestines and spleen may, in view of their relatively sluggish circulation, act as reservoirs of blood. R. T.

Capacity of the arterial system in dogs. R. LEŚKÓW (Acta Biol. Exp., 1937, 11, 113-114).- The distribution of the blood in the arterial system was determined, at pressures of 0—140 mm. R. T.

Blood pressure in the pulmonary and general circulations of Batrachia and reptiles. L. ACOLAT (Compt. rend., 1938, 206, 207—209).— In Batrachia, the pulmonary blood pressure is 1—3 mm. Hg below that of the general circulation, whilst in reptiles the difference is greater (3—25 mm.). W. O. K.

Photo-electric plethysmography of the fingers and toes in man. A. B. HERTZMAN (Proc. Soc. Exp. Biol. Med., 1937, 37, 529—534).—A beam of light is allowed to shine through a finger or toe on to a photo-electric cell which is connected with a string galvanometer. Changes in the calibre of the digital vessels cause changes in the galvanometer readings.

Maintenance of arterial pressure after hæmorrhage. F. DOMÉNECH-ALSINA (Arch. int. Physiol., 1937, 45, 298—309).—The output of adrenaline after experimental hæmorrhage in dogs under chloralose was studied (1) by injecting blood taken during the period of recovery into a second (spinal) dog, (2) by clamping the adrenal veins during hæmorrhage and releasing them after a few min. when effects on the blood pressure should be seen, (3) by observing the rate of the denervated heart. The results showed that recovery of pressure was not due to adrenaline.

C. E. B.

Arterial and venous pressure factors in circulatory failure. T. R. HARRISON (Physiol. Rev., 1938, 18, 86–108).

Direct effect of adrenal cortical hormone on blood pressure in shock induced by intestinal manipulation. W. W. SWINGLE, W. M. PARKINS, A. R. TAYLOR, and H. W. HAYS (Proc. Soc. Exp. Biol. Med., 1937, 37, 601—604).—Adrenalectomised dogs which had been maintained in health for a year on cortical hormone were anæsthetised and the small intestine was manipulated for 20—30 min. Within 12 hr. their arterial pressure fell to 40—50 mm. Hg but on treatment with cortical hormone it slowly rose to normal and all signs of shock disappeared within 48 hr. There was no change in the Na, K, or Cl of the blood. V. J. W.

Entero-renal reflex from thermic stimulation. C. COLOMBI and G. ROCCHINI (Arch. Fisiol., 1937, 37, 45—55).—In dogs under chloralose anæsthesia, renal blood flow was measured by Rein stromuhrs applied to the renal artery and vein. Injection of 20 c. c. of cold (4—5°) Ringer's solution into the small intestine caused a prompt and considerable diminution of renal inflow with increased outflow, indicating powerful vasoconstriction. When the solution was warmer than the body temp. the reverse effects were produced. No effect was obtained by injections into the cesophagus, stomach, or large intestine. The rectum was not examined. It is suggested that the phenomenon is brought about reflexly, rather than humorally. G. S.

Local vascular reaction to cooling of the skin. H. HERMANN, G. MORIN, and J. CIER (Compt. rend. Soc. Biol., 1937, **126**, 1019-1021).—A freezing mixture applied to the dog's limb cools the paw by 20° in $\frac{1}{2}$ hr. The return to normal is delayed after section of the sciatic nerve. D. T. B.

Action of short waves on blood vessels. H. WEISZ, J. PICK, and V. TOMBERG (Klin. Woch., 1937, 16, 750-753).—No sp. action of short waves on the blood vessels of the frog was observed. The changes are due to the heating effects.

F. W. L.

Circulatory effects of the venom of the Indian cobra (Naia naia) in dogs. W. FELDBERG and C. H. KELLAWAY (Austral. J. Exp. Biol., 1937, 15, 441-460).-In the dog intravenous injection of cobra venom (0.2-2 mg. per kg.) lowers systemic arterial and venous pressure; the portal vein pressure is raised. Heart failure preceded by impaired conduction occurs after large doses with rise in venous pressure. Subendocardial hæmorrhages occur in the left ventricle. There is no obstruction in the pulmonary circulation, rise of pulmonary pressure, or ædema of the lungs. The fall of arterial blood pressure is due to vasodilatation. The splanchnic vessels first contract and then dilate. Engorgement and hæmorrhages are present in the duodenal mucosa, decreasing progressively in jejunum and ileum. There is constriction of the hepatic veins and injury to the liver cells. The lymph flow is increased and contains blood corpuscles and hæmoglobin. Bloodhæmoglobin concn. is raised from fluid loss from the circulation resulting from increased capillary per-D. M. N. meability.

Left ventricle as site of histamine shock. A. KLISIECKI and W. HOLOBUT (Arch. exp. Path. Pharm., 1937, 186, 57—77).—No support is given to the usual view that the fall of blood-pressure after large doses of histamine is due to vaso-dilatation in lungs, intestinal tract, or liver. The fall is attributed to a depression of the left ventricle and it is held to be a protective reaction against the tendency to hæmorrhage after injury. T. B. H.

Effect of tyramine on blood-pressure. J. WOLF and K. LUDOLPH (Arch. exp. Path. Pharm., 1937, 186, 89—95).—Prolonged intravenous infusion of tyramine (0.002 mg. per g. per min.) to dogs leads to a sustained rise of blood-pressure lasting during the whole period of the infusion. If larger doses are given (0.4 mg. per g. per min.) there is a very large initial rise of pressure, which gradually subsides.

T. B. H.

Effect of sodium oxalate on heart and arterial pressure. R. HAZARD, L. WURMSER, and J. CHEVMOL (Compt. rend. Soc. Biol., 1937, 126, 998— 1001).—Injection of Na oxalate in the dog (0.05 g. per kg.) depresses the heart and diminishes the action of adrenaline on heart and blood pressure. These effects are antagonised by Ca. D. T. B.

Effect of pyruvic acid on blood vessels. S. KAMIYA (Japan. J. Med. Sci., 1937, II, 3, 285–288).— In rabbits pyruvic acid injections have a vaso-constricting and blood pressure-raising action when injected sufficiently rapidly into an ear vein, whilst slower injections are without effect. Perfusion of the frog's web with small amounts of pyruvic acid pro-

V. J. W.

duces a dilatation and with large amounts a constriction of the blood vessels. T. F. D.

Effect of temperature on the volume flow of blood through the sympathectomised paw of the dog in the observations on the oxygen content and capacity, carbon dioxide content, and $p_{\rm H}$ of the arterial and venous blood. N. E. FREEMAN and J. W. ZELLER (Amer. J. Physiol., 1937, 120, 475—485).—Plethysmographic determinations of the vol. flow of blood through the sympathectomised paws of 3 unanæsthetised, trained dogs in which one adrenal was removed and the other denervated showed that the circulation varied directly with the temp. of the bath in which the paw was immersed. O₂ and CO₂ content and $p_{\rm H}$ of the arterial and venous blood were const.

M. W. G.

Sympathectomy for peripheral vascular disease. G. DE TARATO (Arch. Int. Med., 1937, 60, 990-1001).—After sympathectomy in 24 patients with peripheral circulatory disturbances the O_2 supply to the tissues was increased. There was no histological evidence of pathological processes in the excised ganglia or trunks. T. H. H.

Results of coeliac ganglionectomy in cases of essential hypertension. G. CRILE (Cleveland Clin. Quart., 1938, 5, 33-40).—The results of coeliac ganglionectomy in 129 patients are described. There was marked relief of symptoms in nearly all cases, and in many a fall of blood pressure. C. A. K.

Collateral circulation following experimental vascular occlusion. I. D. STEIN (Amer. Heart J., 1937, 14, 726—734).—Following ligation of the main arteries to the ear of the rabbit an adequate collateral circulation developed, as shown by arteriograms. Applications of suction-pressure exercises produced cyanosis and protracted vasospasm, sometimes leading to necrosis. C. A. K.

Effect of tying the renal artery on bloodpressure. H. KONZETT and K. UNNA (Arch. exp. Path. Pharm., 1937, **186**, 694—701).—Tying a branch of the renal artery in dogs raises the blood-pressure by 20—30 mm. for several days only. If several such branches are tied at successive operations the same rise is seen after each, but no permanent effect is obtained. The result is unaffected by denervation of the kidneys. T. B. H.

Renal lesions as cause of hypertension. E. DICKER (Acta med. scand., 1937, 93, 265-284).-In dogs bilateral nephrectomy did not produce a rise of blood pressure; the presence of renal tissue even if not supplied with blood seems to be necessary. Reduction of the surface for filtration (e.g., by ligature of arterial branches, sclerosis, or placing a clip on the renal arteries) led to hypertension. In some cases following operation, when hypertension appeared it was independent of renal insufficiency. This experimental hypertension cannot be explained either by a nervous mechanism or by the retention of substances which increase the blood pressure.

C. A. A. Relation of the kidneys to blood-pressure. T. R. HARRISON, A. BLALOCK, M. F. MASON, and J. R.

WILLIAMS (Arch. Int. Med., 1937, 60, 1058—1068).— Administration of saline extracts of the kidneys of dogs rendered hypertensive by compression of the renal arteries to rats anæsthetised with pentobarbital Na causes a greater rise in blood-pressure in the recipient animals than extracts of the kidneys of normal dogs. T. H. H.

Chronic arterial hypertension from renal ischæmia after sympathectomy. C. HEYMANS, J. J. BOUCKAERT, L. ELAUT, F. BAYLESS, and A. SAMAAN (Compt. rend. Soc. Biol., 1937, **126**, 434— 436).—Hypertension from compression of the renal artery was produced in dogs previously sympathectomised from stellate to pelvic ganglia. Unilateral renal arterial constriction was also effective. The hypertension is of peripheral origin and humoral.

D. T. B.

Histological examination of aorta and renal vessels in cases of hypertension. S. MIYAKE (Folia Endocrinol. Japon., 1937, 13, 52).—In cases of non-renal hypertension the histological changes in the kidney vessels are more marked than in renal hypertension; the smooth muscle fibres of the small arteries and arterioles are partly hypertrophied, and partly degenerated. The aortic changes are similar in both types of hypertension. A. S.

Arteriosclerosis. W. HUECK (Münch. med. Woch., 1938, 85, 1-5).—A review. A. S.

Relations of adrenals to the atheromatosis of the aorta produced by cholesterol in rabbits. W. RAAB, M. WACHSTEIN, and S. STRAUBER (Z. ges. exp. Med., 1937, 102, 212—218).—Infiltration of the aortic wall with lipins can be produced in rabbits by prolonged feeding with cholesterol. This is unaffected by giving cortin or corticotropic anterior pituitary hormone for months, or adrenalectomy. A. S.

Prevention of cholesterol arteriosclerosis in the rabbit by use of pancreatic extract (Lipccaic). M. J. HUBER, G. O. BROUN, and A. E. CASEY (Proc. Soc. Exp. Biol. Med., 1937, 37, 441—445).—The daily administration of this extract to rabbits receiving 0.5 g. of cholesterol daily prevented the aortic atherosclerosis which occurred in controls, but did not affect the blood-cholesterol. The property was destroyed by boiling. V. J. W.

Production of arteriolosclerosis by proteolytic enzymes. A. R. RICH and G. L. DUFF (Bull. Johns Hopkins Hosp., 1937, 61, 63—70).—Arteriolar lesions were produced in dogs by injection of pancreatic juice, commercial or cryst. trypsin, or papain. These lesions are similar to human hyaline arteriolosclerosis and arteriolonecrosis. It is not yet certain whether the lesion is produced by the direct action of the enzymes or by the action of products of protein decomp. T. F. D.

Endocardial arterial and other mesenchymal alterations associated with serum disease in man. E. CLARK and B. I. KAPLAN (Arch. Path., 1937, 24, 458—475).—The findings in two cases of pneumonia with serum-sickness following antipneumococcal serum are described. Proliferation of the histiocytes occurred in the mural and valvular endocardium and in the intima of the aorta and the pulmonary and coronary arteries, with necrotising arteritis and periarteritis in one case. The similarity to the lesions in animals induced by protracted anaphylaxis appears to indicate that the alterations are hyperergic and related to the administration of foreign serum. These changes are not const. and were also found in a mild form in one case of pneumonia which had not received serum.

C. J. C. B.

Direct determination of capillary permeability. F. WIND (Arch. exp. Path. Pharm., 1937, 186, 161– 184).—A method is described for measuring the escape of fluid from frog capillaries in the mesentery and renal glomerulus, and for calculating therefrom the coeff. of permeability. The figures obtained from different areas in the same mesentery vary considerably. The figures of the function of the term of the figures of the

(d) RESPIRATION AND BLOOD GASES.

Interalveolar communications in normal and in pathological mammalian lungs with review of the literature. C. G. LOOSLI (Arch. Path., 1937, 24, 743-776).-Normal monkeys, dogs, cats, rabbits, guinea-pigs, rats, mice, and opossums were killed by pentobarbital Na or gas, and the aorta was clamped before the heart stopped beating to produce congestion of the pulmonary capillaries. In other normal animals, the lungs were injected intratracheally after death with plasma which was allowed to clot; the whole was then fixed in Zenker-acetic acid. 15 monkeys and 30 dogs were infected intratracheally by type 1 pneumococcus and killed at intervals to show all stages of pneumonia. In thick, and less easily in thin, sections the pores were observed, some of uniform bore, some funnel-shaped, and others with a central constriction. In the plasma injected and pneumonic lungs, the fibrin formed a continuous intra-alveolar network extending through the pores. The pores are normal constituents of the alveolar walls. They provide an important passage by which infections and growths spread throughout a lobe. The literature is fully reviewed. (21 photomicrographs.) C. J. C. B.

Pressures and elasticity in human lungs. O. NORDENFELT (Acta med. scand., 1937, 93, 297–307). —Pressures in the lungs and œsophagus were measured with Hg manometers in 5 patients. A duodenal tube fitted with a thin rubber sack at the extremity was utilised for the latter purpose. During deep inspiration the pressure in the œsophagus was about 10 mm. lower than in the lungs; during expiration, the pressure was equal or less. The elasticity of the lungs was an important factor in producing this difference. C. A. A.

Body plethysmograph for measuring respiratory volumes with high respiratory rates. A. HEMINGWAY (Science, 1938, 87, 47–48).—An apparatus for recording respiratory rate and vol. in the unanæsthetised dog is described. It is suitable for rates up to 300 per min. C. A. K.

[Isolation and composition of] alveolar air. W. SCHOEDEL (Ergebn. Physiol., 1937, 39, 450–488). —A review. W. McC. Vital capacity and blood-letting in healthy human subjects. G. BUDELMANN (Klin. Woch., 1937, 16, 704—705).—In 7 healthy subjects after blood-letting of 500 to 1000 c.c. the vital capacity increased by 300 to 500 c.c. This increase was not always proportional to the amount of blood lost. The alteration was not observable for longer than 1 hr. F. W. L.

The diaphragm and regulation of respiratory volume. H. DE WAELE and J. VANDEVELDE (Arch. int. Physiol., 1937, 45, 484—490).—The intraabdominal pressure is practically const. in the hare or dog at rest. Its alterations when air is breathed at high or low pressures do not depend on movements of the diaphragm, and may be contrary in direction to that which diaphragmatic movement alone would produce. The diaphragm and abdominal muscles work together as a result of afferents in the vagus nerves. C. E. B.

Periodic breathing. G. MANSFELD and F. V. TYUKODY (Arch. int. Pharmacodyn., 1937, 57, 335– 341).—Removal of cerebellum in dogs causes apnear followed by Cheyne–Stokes respiration. D. T. B.

Site of the respiratory centres. G. STELLA (Arch. int. Pharmacodyn., 1937, 57, 349—356).— No evidence was obtained in the decerebrate dog that the cerebellum takes part in chemical or reflex control of respiration. Important co-ordinating mechanisms are situated in the pons. D. T. B.

Action of curarine on respiratory mechanism. R. WEST (J. Physiol., 1938, 91, 437—446).—Sudden failure of respiration after injection of curarine is due to acute pulmonary collapse. The sequence of events (rabbits, cats, guinea-pigs) is : (1) loss of tone in respiratory muscles, particularly in diaphragm; (2) consequent reduction in chest vol., and fall in intrapleural negative pressure. The resulting retraction of the lung is assisted by (3) an active broncho-constriction produced by curarine, (4) the passive broncho-constriction produced by a rise in intrathoracic pressure and (5) a loss of power of contraction and a failure of maintenance of contraction in the inspiratory muscles. An impurity may be the cause of (3). J. A. C.

Physical phenomena associated with the anxiety states and their relation to hyperventilation. W. J. KERR, J. W. DALTON, and P. A. GLIEBE (Ann. intern. Med., 1937, **11**, 961-991).--The association of emotional disturbances with physiological changes is illustrated by case records. Special attention is given to the effects of hyperventilation. C. A. K.

Influence of oxygen tension on oxygen consumption in mice. M. L. CHEVILLARD, F. HAMON, and A. MAYER (Ann. Physiol. Physicochim. biol., 1937, 13, 1145—1163).—White mice die when the O_2 content of air is lowered to 8%. If the tension is lowered slowly it may be reduced to 4% and the mouse lives 24 hr. Thermoregulation fails at low O_2 tensions; the O_2 consumption is then greater than when thermoregulation is normal. D. T. B.

The Pathology of High Altitude Climate. A. LOEWI and E. WITTKOWER (Oxford University Press, 1937, pp. 222).-High altitude climate is much more complicated than mere O, want, and the effect of its various factors on persons exhibiting the whole gamut of pathological conditions produces baffling permutations and combinations. The first chapter is on the climate of high altitudes. The second chapter deals with the constitution of the inhabitants. Chapter III, on diseases occurring in high altitudes, occupies nearly half the book, and contains a wealth of interesting and useful information. Chapter IV deals with the question of mortality. Chapter V (2 pp.) deals with "transitional" diseases, and Chapter VI discusses the curative effects of high altitude and ends with the contra-indications. J. B.

Anoxæmia, hyperoxæmia, and tissue-glutathione. L. BINET and M. BOCHET (Compt. rend. Soc. Biol., 1937, 126, 674—676).—Anoxæmia and hyperoxæmia in dogs are accompanied by decreased and increased tissue-glutathione, respectively.

H. G. R.

Oxygen dissociation curves of cow's blood during pregnancy and of the new-born animal soon after birth. J. Roos and C. ROMIJN (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 803— 812).—In the first 8 months of pregnancy O_2 dissociation curves of cows' blood lie within normal limits. The more marked inflexion appearing in the 8—9th month is not due to change of [H⁻] but may result from changes in maternal hamoglobin or in blood-electrolytes. Fœtal hamoglobin differs from maternal hamoglobin in showing a lower O_2 affinity. After birth this is partly counteracted by increased blood-alkalinity, which, however, is not maintained after 4 days. After 8 days fœtal is largely replaced by the maternal type of hamoglobin. A. G. P.

Carbonic anhydrase inhibitor in serum. V. H. BOOTH (J. Physiol., 1938, 91, 474–489).—The inhibitor in pig blood supresses 90% of the enzyme liberated from 5% of corpuscles. It has many of the properties of pseudoglobulin from which it has not been separated. Inhibition increases with rise of temp. The inhibitor is found in sera also from adult and fœtal sheep, horse, ox, cat, and rat, but not from bloods of man, monkey, duck, and pigeon.

J. A. C. Hereditary physiological anomaly of a certain strain of Drosophila. P. L'HÉRITIER and G. TEISSIER (Compt. rend., 1937, 205, 1099—1101).— The toxic action of CO₂-air mixtures of varying composition on a particular strain of Drosophila is described. A. L.

Influence of carbon dioxide therapy on experimental alcoholæmia. D. LEONARDO (Boll. Soc. ital. Biol. sperim., 1937, 12, 654—656).—Administration of $CO_2 + O_2$ accelerates the disappearance of alcohol from the blood of dogs following ingestion of ethyl alcohol. The effect is due to increased pulmonary ventilation. F. O. H.

Carbon dioxide in blood and cerebrospinal fluid of sucklings. T. TANAKA and S. OKUDA (J. Oriental Med., 1937, 27, 133).—CO, determinations in 25 normal infants show only slight difference from adult figures. P. C. W.

Enzyme actions of pulmonary tissue. S. IZUMI, T. TANAKA, and T. TAKANO (J. Oriental Med., 1937, 27, 131—132).—Dried fat-free lung tissue has amylase, glycolytic, tryptic, lecithinase, and antiurease activities. There is a difference in lecithinase content between right and left ventricular blood. P. C. W.

Rôle of the air bladder in the respiration of fish. F. KHALLL (Z. vergl. Physiol., 1937, 25, 256— 282).—The content of the air bladder (Haldane analysis) and the O_2 consumption were investigated in various species (*Tinca, Cyprinus, Idus*), with varying O_2 pressures. If the O_2 pressure is lowered, the O_2 consumption and the O_2 content of the air bladder are reduced; an increase of CO_2 is found in the air bladder, while the CO_2 content of the water remains unchanged. The amount of O_2 absorbed from the bladder during O_2 want cannot be used for respiration for more than 4—10 min. In *Cyprinus*, the O_2 content of the air bladder is very low (about 1%); if artificially raised, it is soon brought down by absorption to the normal level. B. K.

Function of the air bladder in fish. IV. Fish with air bladder remaining empty. J. von LEDEBUR and W. WUNDER. V. Oxygen dissociation curves of fish. J. VON LEDEBUR (Z. vergl. Physiol., 1937, 25, 149-155, 156-159).--IV. Experiments were made on Gastroteus aculeatus and similar species. In these fish, the ductus pneumaticus connecting the air bladder with the alimentary canal is obliterated shortly after birth. Filling of the air bladder was prevented by keeping the animals under water. Although the air bladder remained empty, the animals were kept alive (though developing subnormally) for more than a year. No compensatory filling of the intestines with air took place in these The empty air bladder became completely species. obliterated after some time.

V. The O_2 dissociation curves of the blood of various fish were determined for varying CO_2 conces. The dependence of O_2 dissociation on CO_2 content differs in various species. No relation was found between the power of the animals to secrete O_2 into their air bladder and the effect of CO_2 on the O_2 dissociation. The accumulation of O_2 in the air bladder cannot be explained entirely by diffusion of O_2 , dissociating from oxyhæmoglobin in the blood. B. K.

Mechanism of "air spitting" in fish. G. FRANZ (Z. vergl. Physiol., 1937, 25, 193—238).—The reflex mechanism of "gas spitting," elicited by a lowering of external pressure, was investigated in various fish. The production of the reflex depends on the size and rate of pressure change, and the degree to which the air bladder is filled with gas. The influences of varying loads on the body temp., illumination and gas content of the water, were investigated. "Air spitting" is an active process; normally, the pressure in the air bladder is maintained by constriction of the sphincter muscle of the ductus pneumaticus. During the reflex activity, the muscles of the wall of the bladder contract. The receptor organs involved are utriculus and eyes; in some fish, the wall of the bladder also contains receptor organs. The nervous path for the secretory and reflex mechanism of the bladder was studied. N. splanchnicus regulates the secretion of gases into the bladder; if both vagi are cut, the secretion and the resistance of the sphincter against the discharge of air are abolished. A centre regulating the secretion or the "spitting reflex" exists in the diencephalon. B. K.

Respiratory exchanges in the gopher in hibernation. C. KAYSER (Compt. rend. Soc. Biol., 1937, **126**, 1222—1224).—The mean R.Q. of the gopher in winter sleep was 0.728. D. T. B.

Significance of variations in the respiratory quotient as a function of the temperature of the medium in the awakening hamster. C. KAYSER and P. DELL (Compt. rend. Soc. Biol., 1937, 126, 698—700).—A decrease in the R.Q. was observed on lowering the temp., providing no shivering occurred. H. G. R.

(e) MUSCLE.

Musculature of Trichoptera larvæ. L. VON BOGA (Z. Zellforsch., 1937, 27, 568—602).—The striations of the striated muscle of these larvæ vary with the state of physiological activity and are described in detail. They are absent at the insertion of the muscle where it continues into the chitin as an epithelial strand. The longitudinal muscle of each segment is incompletely separated from that of neighbouring segments by chitinous ridges. The size of the muscle fibres is $3-4 \mu$. contracted and $15-16 \mu$. relaxed. R. J. O'C.

Simultaneous analyses of muscle at different places. Weather and the chemistry of muscle. O. RIESSER [with H. SÜLLMANN, A. FLEISCH, A. STOUDER, K. VON NEERGAARD, and W. MÖRIKOFER] (Biochem. Z., 1937, 294, 268-280; cf. A., 1935, 890; 1937, III, 21).—Determinations made simultaneously at various times of day during a period of 8 months in Basle, Lausanne, Zürich, and Davos, of the PO4" content of the muscle of different guineapigs show that the type of variation in the content previously observed at one place occurs at these four places also, although the curves plotted from the results differ for the different places. No relationship exists between variations in meteorological conditions and those in the PO₄" content. The results may not be comparable with those previously obtained, since in the earlier, but not in the present, experiments W. McC. anæsthesia was employed.

Exchange of salt and water between muscle and blood. IV. Correction of values for volume phases of skeletal muscle. Determination of blood volume in muscle. L. EICHELBERGER (J. Biol. Chem., 1938, **122**, 323—332).—Intravenous injections of colloidal ThO₂ in dogs are followed in 1—3 min. by a fall in blood-Th and then a period (about 30 min.) of const. concn. during which there is no significant change in Cl' or water of the serum, red cells, or muscle. During this const. period the concn. of ThO₂ in fat-free muscle, which is dependent on the vol. of circulating blood, is 0.311-0.500-mM. A method is described for the determination of Th dependent on the titration of the oxalate against 0.01N-KMnO₄. ThO₂ is not stored in skeletal muscle, the intracellular phase of which amounts to 86% of the muscle. The intracellular phase contains 73% of water. P. G. M.

Histophysiology of muscular glycogen. P. ROJAS and L. S. RESTA (Compt. rend. Soc. Biol., 1938, 127, 159—160).—A slight decrease in muscular glycogen in the hepatectomised, and a greater decrease in the adrenalectomised, toad were observed. Resynthesis after exhaustion by tetanus was normal in the former and slow in the latter. H. G. R.

Reversible inhibition of muscle glycolysis. C. L. GEMMILL and L. HELLERMAN (Amer. J. Physiol., 1937, 120, 522—531).—In small concns., phenylmercuric hydroxide, *p*-chloromercuribenzoic acid, and HgCl₂ inhibit glycolysis in extracts of frog's muscle. The degree of inhibition depends on the concn. of the compound; the use of cysteine or glutathione abolishes this inhibition. An inhibition produced by I is also reversible (reactivants are cysteine, glutathione, and ascorbic acid).

M. W. G.

Influence of nervous system on carbohydrate and fat of muscle. F. CEDRANGOLO (Arch. Sci. biol., Napoli, 1937, 23, 377–398).—In frogs section of the sciatic nerve results in a rise in the glycogen content of gastrocnemius. In fasting dogs glycogen disappears more slowly from denervated than from innervated muscle, and fat is not mobilised at all from denervated muscle. Glycogen and fat can be laid down as well in denervated as in innervated muscle. R. S. CR.

Rôle of amylase in muscle glycogenolysis. E. M. MYSTKOWSKI (Acta Biol. Exp., 1937, 11, 16— 19).—Phosphorylytic and amylolytic decomp. of glycogen in dialysed muscle extracts are independent and competing processes. The velocity of phosphorylation rises with increasing $[PO_4^{\prime\prime\prime}]$ of the extracts, and is greater in presence of KCl than of NaCl. It is concluded that the amylase content of muscle extracts is very small, that amylase takes no part in glycogenolysis in such extracts, and that glycogen itself, and not its degradation products, undergoes phosphorylation. R. T.

Rigidity of iodoacetate-poisoned skeletal muscle. Iodoacetate poisoning without muscular rigidity. F. FERARI and P. FORNAROLI (Boll. Soc. ital. Biol. sperim., 1937, 12, 694–695).— The rigidity of frog's gastrocnemius muscle, perfused with isotonic fluid containing 0.01% of iodoacetic acid and at varying $p_{\rm H}$ (PO₄^{'''} buffer), falls with decreasing $p_{\rm H}$ (equiv. to 85, 40, and 1 g. at $p_{\rm H}$ 7.6, 6.9, and 3.6, respectively). F. O. H.

Effect of carnosine on glycolysis of muscle tissue. R. J. JUDELOVITCH (Biochimia, 1937, 11, 705—712).—Carnosine in NaHCO₃-Ringer or PO₄^{$\prime\prime\prime$} buffer solutions inhibits glycolysis in rat diaphragm and minced muscle under anaërobic conditions and increases the rate of breakdown of the P₂O₇^{$\prime\prime\prime\prime$} fraction. No effect was observed with rabbit brain cortex. J. N. A.

Does pyrophosphoric acid occur in muscle? D. FERDMAN and O. FAINSCHMIDT (Biochimia, 1937, 11, 776—781).—Careful alkaline hydrolysis of a muscle extract yielded 6—10 mg. of P per 100 g. as $H_4P_2O_7$ from adenosinetriphosphoric acid.

J. N. A.

Factors affecting sodium, potassium, and total base content of anterior retractor of byssus of Mytilus edulis. I. SINGH (J. Physiol., 1938, 91, 298-412).-Fuller details are given of some earlier experiments (Physiol. Abs., 1937, 22, 366). Also immersion in solutions of certain univalent ions causes muscle to gain wt. and base in the following order : $Li < Na < NH_4 < K, Cl < Br < NO_3 < I < CNS < I$ CN. With bivalent cations base is gained in the order Ca < Sr < Ba. Mechanical friction increases the gain in wt. produced by the above ions. Small concns. of Ca, Mg, K, and decrease in $p_{\rm H}$ partly antagonise the effects of some of the above cations. Tone of muscle greatly increases under conditions in which total base and Na content of muscle increase. J. A. C.

Chemical changes in muscles of horses suffering from paralytic myoglobinæmia. S. GRZYCKI and W. GUCFA (Acta Biol. Exp., 1937, 11, 183— 188).—The fatigued muscles of horses suffering from paralytic myoglobinæmia are distinguished by their high NH_3 and low phosphagen contents, with impaired glycogenolytic power; normal vals. are obtained after insulin therapy. The high blood-creatinine is ascribed to deficient resynthesis of adenosinetriphosphoric acid, in absence of which phosphorylation of creatinine cannot take place. R. T.

Pigments of salmon. B. E. BAILEY (J. Biol. Board, Canada, 1937, **3**, 469–472).—The red colour of the flesh of the sockeye salmon (*Oncorhyncus nerka*) is due to two carotenoid pigments similar to astacene. Pigments from the steelhead salmon (*Salmo gairdneri*) appear to be identical. E. C. S.

Effect of hypotonic and hypertonic Ringer on isotonic and isometric contraction of muscle. F. R. STEGGERDA and F. H. SCOTT (Proc. Soc. Exp. Biol. Med., 1937, 37, 535-536).—Frog's gastrocnemius immersed in hypotonic Ringer's solution gives a greater isotonic contraction than controls, but an identical isometric response. In hypertonic solution both are decreased. V. J. W.

Influence of non-electrolytes on water content of living and dead muscle. M. M. D. NASSONOV and E. AISENBERG (Ann. Physiol. Physicochim. biol., 1937, 13, 1179—1212).—The influence of glycerol, sugars, peptone, and protein on the water content of muscle depends on the vol. which the substance occupies in the solution. The muscular cell is permeable not only to sugar, but also to peptone, dextrin, albumin, and gum. The living muscle cell is not subject to osmotic laws and cannot be considered as a living osmometer. The cell obeys the same laws as the dead fibre. D. T. B.

Action currents in voluntary movement. V. RASCANO, M. KAPRI, and V. BUSILA (Compt. rend. Soc. Biol., 1937, 126, 819—823).—The myogram and electromyogram were simultaneously recorded from the flexor of the middle finger. Attention is drawn to the importance of two categories of oscillations, nervous and muscular, which are the expression of

both forms of energy at different phases of the contraction. D. T. B.

Influence of muscular activity on œdema production by perfusion with saline. R. FERRARI and P. FORNAROLI (Arch. Sci. biol., Napoli, 1937, 23, 429—437).—The increase in a frog's wt. produced by perfusing it with Ringer's solution is much reduced if, during or before the perfusion, its muscles are made to contract by electrical stimuli. It is concluded that the osmotic pressure of muscle colloids is lowered by muscular activity. R. S. CR.

Effect of alkalosis on muscular performance. (A) H. DENNIG, H. BECKER-FREYSENG, E. KRAUSE, and W. ALBATH. (B) E. KRAUSE, H. BECKER-FREYSENG, and G. GILBRICHT (Arch. exp. Path. Pharm., 1937, **186**, 611—616, 617—620).—(A) The onset of exhaustion after severe muscular exercise, such as running or bicycle-riding, which is accelerated by giving NH_4Cl , can be considerably delayed by administration of org. Na or K salts.

(B) The onset of exhaustion from severe muscular exercise can definitely be delayed by a diet rich in basic constituents, such as soya meal. The effect is not so pronounced as that obtained by administration of alkali-producing salts. T. B. H.

Propagated contraction and α effect. J. MEYER (Compt. rend. Soc. Biol., 1937, 126, 931— 933).—Experiments demonstrating neuromuscular heterochronism were carried out on the sartorius of the frog. D. T. B.

Excitability for rectangular currents in the adrenalectomised frog. L. D'HOLLANDER (Compt. rend. Soc. Biol., 1937, 126, 933—935).—Adrenalectomy in the frog causes no change in the muscular excitability, direct or indirect, tested by rectangular currents. D. T. B.

Latent period of frog's muscle in relation to stimulation interval. A. BETHE (Pflügers Archiv, 1937, 239, 1—20).—When frog muscle receives two stimuli, the latent period of the second contraction is increased if the second stimulus is sent in at the height of the first contraction or in the first half of relaxation. At the end of relaxation and for some time after, the latent period is decreased. With rhythmic stimulation at short intervals (incomplete tetanus) the latent period increases with the first contractions, but later decreases. J. M. R.

Graded response of the muscle of Japanese giant crab for indirect stimulation. T. KAMADA and H. KINOSITA (Proc. Imp. Acad. Tokyo, 1937, 13, 374—377).—In Macrocheira kæmpferi gradation of contraction of the dactylopodite flexor is achieved through variation of the impulse frequency in the motor nerve. Each axon innervates nearly all the fibres in the muscle. W. F. F.

Action of choline esters in myasthenia gravis. F. R. FRASER, M. McGEORGE, and G. E. MURPHY (Clin. Sci., 1937, 3, 77—89).—Subcutaneous acetylcholine, acetylmethylcholine, and carbamylcholine lead to a recovery of muscle power which is more prolonged than that produced by prostigmine. If injected intra-arterially, the muscles of the injected

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limb recover before the muscles of the body generally. Choline has no effect. It is suggested that the choline esters are utilised in the elaboration of a precursor from which acetylcholine is set free at the neuromuscular junction, and that a defect in the production of acetylcholine is present in myasthenia gravis. A. N. D.

Case of familial periodic paralysis. R. S. AITKEN, E. N. ALLOTT, L. I. M. CASTLEDEN, and M. WALKER (Clin. Sci., 1937, 3, 47—58).—A very complete investigation of the blood-serum during and between attacks. The main change is in the blood-K, which is abnormally low during the attacks. This is thought to block the neuromuscular junctions or inhibit the contractile response in the muscles. Attacks can be brought on by lowering the K level by the combined injection of insulin and ingestion of glucose. They can be abolished by the oral administration of K. A. N. D.

Choline-esterase in striated muscle after degeneration of the motor nerve. A. MARNAY and D. NACHMANSOHN (Compt. rend. Soc. Biol., 1937, 126, 785-787).—An increase in the concn. of the enzyme was observed after denervation which was not due to concn. by loss of water. H. G. R.

Choline-esterase of denervated muscle. E. MARTINI and K. TORDA (Klin. Woch., 1937, 16, 824-825).—The esterase activity of the cat's gastrocnemius diminished after sciatic nerve section to an average of 88% on the 2nd day and 26% on the 12th. F. W. L.

Action of acetylcholine and nicotine on degenerating muscle. R. MARBURG (Arch. exp. Path. Pharm., 1937, 186, 107—112).—Winter's finding was examined, that in degenerating as contrasted with normal muscle the insertion of a needle electrode sets up a series of pronounced electrical oscillations. Oscillations of this kind are little affected by previous Ca injections, but are made coarser and more pronounced by application of acetylcholine, eserine, or nicotine. The oscillation effect is attributed to the chemical products of stimulation of sensory nerve-endings. T. B. H.

Response of worms and molluscs to eserine. Z. M. BACQ and G. COPPÉE (Arch. int. Physiol., 1937, 45, 310-324).—A more detailed account of work previously reported (Physiol. Abs., 1937, 22, 491; A., 1938, III, 23) showing that eserine increases and prolongs the muscle response in certain worms but not in certain molluscs, and that stimulation of motor nerves in the leech produces a substance resembling acetylcholine. C. E. B.

Action of tyramine and adrenaline on denervated nictitating membrane. E. BULBRING and J. H. BURN (J. Physiol., 1938, 91, 459—473).—The effect of tyramine on the denervated nictitating membrane (D.N.M.) is compared with the effect on the normal membrane in the spinal cat; when the dose is small D.N.M. contracts more than normal membrane; when the dose is large the result is reversed. In some cats the response of D.N.M. to large doses of adrenaline is less than that of normal membrane; denervation does not always increase

the response to adrenaline. The rule is true for lower doses only. J. A. C.

Does the nictitating membrane of the cat have a refractory period? A. ROSENBLUETH and G. H. ACHESON (Amer. J. Physiol., 1937, **120**, 514—521).— Injections of 933 F decrease the contractions of the membrane. The summation curve to two nerve volleys is unaffected by administration of the drug. In a partly contracted membrane a given frequency of stimulation of the nerves elicits the same increment of tension whether the initial partial contraction be produced by adrenaline or by nerve stimulation. No refractory period can be demonstrated. M. W. G.

(f) NERVOUS SYSTEM.

Differentiation in vitro of young nervous tissue. J. SZEPSENWOL and S. GOLDSTEIN (Arch. exp. Zellforsch., 1938, 21, 155—170).—Fragments of neural tube free from mesoderm of the 3—5-day chick embryo cultivated *in vitro* showed an increase of fibres; this is attributed to regeneration. New formation was seen in fragments from the 2-day and 36-hr. embryo, but in the latter simultaneous cultivation of surrounding mesoderm and ectoderm was necessary. In the presence of structures derived from these two layers portions of the medulla and hind brain of the 24-hr. embryo showed formation and orientation of fibres comparable with that seen *in vivo*. This shows that development of nerve fibres is influenced by structures they normally innervate. R. J. O'C.

Statistical researches on size of human nerve cell nuclei and nucleoli. F. KÖRNER (Z. mikr.anat. Forsch., 1937, 42, 81-115).-Using cervical spinal and Gasserian ganglia of an adult male, a 16-year-old boy, and a 7-months foetus, measurements were made with a planimeter of the nerve-cell nuclei and nucleoli areas from drawings at $\times 2650$. 200 examples for each age and specimen were measured, vols. were calc. from the areas, and frequency curves drawn. The Gasserian ganglion cell nuclei were the same order of size as the spinal ganglion cell nuclei in the boy, but much smaller than in the adult. Although statistical probabilities and standard deviations are not calc., the curves are claimed to obey Heidenhain's law of rhythmical doubling growth. "Wear and tear" pigment was more abundant in the spinal ganglion cells of the 16-yearold boy than in the adult; it is concluded that the pigment is concerned with physiological activity rather than with age. The nucleoli are regarded not as a metabolic by-product, but a living substance; they were found to quadruple their vol. rhythmically corresponding with the rhythmic doubling of nuclear volume. J. H. G.

Spinal efferent fibres of the horse. H. KIMATA (Z. Zellforsch., 1937, 27, 430—436).—The % of small and large fibres, and of medullated and non-medullated fibres, is given for the various spinal nerve roots of the horse. R. J. O'C.

Non-medullated fibres in the posterior spinal roots of the cat. T. SAWATARI (Z. Zellforsch., 1937, 27, 637-639).—The no. of non-medullated fibres in the posterior spinal roots of the cat is about one third of that of the small medullated fibres, and is decreased by removal of the sympathetic chain.

R. J. O'C.

Electrical signs of nervous activity. J. ERLANGER and H. S. GASSER (University of Pennsylvania Press; Oxford University Press, 1937, pp. 221).-This is the third series of Johnson Foundation Lectures given in Philadelphia in 1936. The first three lectures are by Erlanger on "The analysis of the compound action potential of nerve,' "The comparative physiological characteristics of nerve fibres," and "Some reactions of nerve fibres to electrical stimulation." The last two lectures are by Gasser on "Sequence of potential changes" and "The excitability cycle." In its attractive form this book is a necessary part of the equipment of all who intend to work, or to lecture, on the properties of nerve. It is well illustrated, indexed, and docu-A. V. H. mented.

Theory of local circuits and the form of action potential. G. H. BISHOP (Arch. int. Physiol., 1937, 45, 273—297).—Starting from the fundamental hypothesis of the physiological membrane theory that the essential electrical result of stimulation is a p.d. at right angles to the surface of the tissue, the equipotential lines produced by an active point were studied and illustrated in two-dimensional diagrams. Since the membrane theory shows that longitudinal p.ds. will be produced by p.ds. perpendicular to the surface, similar results are obtained though with different conceptions to the results of Craib or Wilson based on the theory of the dipole. C. E. B.

Excitation of crustacean nerve fibre by action current of another. D. AUGER (Compt. rend. Soc. Biol., 1937, **126**, 1006—1010). D. T. B.

Relation of blood-calcium to central and peripheral motor excitability. P. CHAUCHARD and L. LEGER (Compt. rend. Soc. Biol., 1937, **126**, 961— 964).—Cortical and peripheral motor excitability was measured in a trephined dog. The motor chronaxies are diminished by diminution of blood-Ca and increased in hypercalcamia. D. T. B.

Scratch reflex in frogs. E. DIEBSCHLAG (Z. vergl. Physiol., 1937, 25, 143—148).—The scratch reflex can be inhibited in normal and decerebrate frogs by simultaneous production of optomotor reactions (rotatory nystagmus); this is due to general activity of the cerebrum or the brain stem, and not to a special inhibitory centre in the brain. B. K.

Straightening reflex in water in relation to terminal excitation of the nasal region. IV. Experiments in normal and delabyrinthised guinea-pigs. A. M. DI GIORGIO (Boll. Soc. ital. Biol. sperim., 1937, 12, 649—651).—The reflex movements of guinea-pigs (blindfolded and with the tactile hairs of the snout removed) on immersion in water were studied. The movements of both types of guinea-pig correspond with those on falling in air only when the temp. of the water causes no reflex excitation. Outside this "zone of thermal indifference," the reflex movements depend on whether only one or both of the nostrils make the first contact with the water. F. O. H.

Straightening reflex and swimming movements in water of thalamic and mesencephalic guinea-pigs. V. Relationship to the terminal excitation of the nasal region. A. M. DI GIORGIO (Boll. Soc. ital. Biol. sperim., 1937, 12, 651-653).-The movements on immersion in water at varying temp. indicate that swimming is controlled by the retrothalamic centre despite the greater nervous complexity demanded by the necessity of preventing the respiratory passage being immersed. The centre of dorsal flexure of the head, on which depend all the straightening reflexes of the body, is localised posteriorly to the thalamus. Impulses to the terminal fifth nucleus determining reactions of some of the neck muscles do not reach the optic thalamus or the cerebral cortex. F. O. H.

Effect of local anæsthetic (cocaine) on the postrotatory ocular reaction in guinea-pigs and rabbits. M. GRILLI (Boll. Soc. ital. Biol. sperim., 1937, 12, 657-658).—Introduction of cocaine into the conjunctival sac extensively modifies the ocular reactions to labyrinthine stimulation. F. O. H.

Effect of the palæocerebellum on vasomotor reflexes. G. MORUZZI (Boll. Soc. ital. Biol. sperim., 1937, **12**, 676—677).—Faradic stimulation in cats indicates that the palæocerebellar cortex exerts an inhibitory action on vaso-constrictor and -dilator reflexes, the action being removed by cocainisation of the stimulated area but not by curarisation.

F. O. H.

Effects of muscular fatigue on the Purkinje cells of the mouse. W. ANDREW (Z. Zellforsch., 1937, 27, 534—554).—Mice were exhausted by forced physical activity and the Purkinje cells of the cerebellum compared with control animals of the same age. The age factor must be considered, as there are differences in the Purkinje cells of old and young mice. The effect of fatigue was most marked in mice over 98 days old, and consisted of an increase in the size of the cell body, a loss of Nissl substance, and increase of the basophilic properties of the nucleus. In the senile animals there are also irregularity of the cell body, hypochromatism, and many binucleate cells.

R. J. O'C.

Claude Bernard-Horner syndrome in lesions of the optic thalamus. R. GARCIN and M. KIPFER (Compt. rend. Soc. Biol., 1937, 126, 864—866).— Miosis was produced in dogs by injury to the thalamus. D. T. B.

Fibre connexions of the cortex of areas 7a and 7b in the ape's brain. S. SAKUMA (Z. mikr.-anat. Forsch., 1937, 42, 70-80).—The cortical areas 7a and 7b (Vogt's brain chart) were destroyed in 4 macaques with the diathermic cautery. Degeneration was traced by the Marchi method. These areas correspond with the anterior part of the superior parietal lobule of the human brain, and according to Vogt give eye movements on electrical stimulation. Many association and commissural connexions were found in these areas, but few cortico-fugal projection fibres; the latter were extra-pyramidal fibres to the lateral nucleus of thalamus, fibres to the lateral part

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of the stratum intermedium of the peduncle and to the substantia nigra, and a few to the pontine nuclei. Very few fibres joined the pyramidal tract, some being cortico-bulbar. J. H. G.

Action of potassium, calcium, and acetylcholine on cerebral cortical electrical reactions. V. BONNET and F. BREMER (Compt. rend. Soc. Biol., 1937, 126, 1271-1275).-KCl and acetylcholine stimulate the spontaneous cortical electrical activity in the isolated brain of the cat, and the acoustic responses. Ca in effective doses depresses the activity. D. T. B.

Temporal relationship between brain potentials and certain neuromuscular rhythms. L. E. TRAVIS and C. N. COFER (J. exp. Psychol., 1937, 21, 565-569).-Oscillograph records showed no relationship between brain potentials and neuro-muscular rhythm as seen in the tremors of certain fingers and G. W. toes.

Encephalisation of brightness discrimination in mammals. E. GHISELLI (Science, 1937, 86, 618-619).-Brightness discrimination tests were performed in rats after destruction of the superior colliculus or the striate area of the cortex. The latter was shown to be more efficient than the former in C. A. K. mediating such discrimination.

Limits of the optically active cortex of the rabbit. J. L. O'LEARY and G. H. BISHOP (Proc. Soc. Exp. Biol. Med., 1937, 37, 539-541).-Galvanometer leads were connected with different points of the cerebral cortex and deflexions recorded on optic stimulation. Subsequent histological examination showed that the limits of the optically excited area were nearly the same as those of the area striata.

V. J. W.

Alleged convulsant properties of brain extracts. H. M. KEITH and D. MCEACHERN (Proc. Soc. Exp. Biol. Med., 1937, 37, 543-547).—Con-vulsions were induced in cats either electrically or by injection of thujone. Extracts of their brains failed to cause convulsions in rabbits though inducing severe cardiac depression. V. J. W.

Effect of certain nutritional deficiencies on various phosphorus-containing fractions of the chick brain. R. W. ENGEL and P. H. PHILLIPS (Proc. Soc. Exp. Biol. Med., 1937, 37, 553-556).-Chickens suffering from encephalomalacia or deficiency of vitamin-A or $-B_4$ were killed at 10-21 days and brain analyses made. In the trichloroacetic acid extract the ester-P was reduced and the inorg. P increased as compared with controls. The P of the alcohol extract was slightly increased, but the P of the residues after extraction and of the original brain V. J. W. tissue was unaffected.

Distribution of diethylbarbituric acid in the brain. E. KEESER (Arch. exp. Path. Pharm., 1937, 186, 449-450).-The distribution of administered diethylbarbituric acid in the brain of dogs is similar to that in rabbits, *i.e.*, in thalamus and midbrain, and not in the cortex. T. B. H.

Cerebral distribution of urea injected into the blood. M. RISER, P. VALDIGUIÉ, and J. GUIRAUD (Compt. rend. Soc. Biol., 1938, 127, 16-17).-Urea injected into dog's blood passes rapidly into nervous and muscular tissue, and is rapidly eliminated. It passes slowly into the cerebrospinal fluid, and from there is slowly eliminated. The passage from blood to brain tissue is direct. D. T. B.

Rossolimo's reflex. L. RIMBAUD, G. ANSELME-MARTIN, and G. PARTELIDÈS (Arch. Soc. Sci. méd. biol., 1937, 117-119).-The reflex was present in 400 new-borns examined, but disappeared during the third month. In pyramidal tract lesions, and especially in disseminated sclerosis, it is more const. and earlier in appearance than Babinski's sign. P. C. W.

New outlook on the physiology and pathology of mental and emotional states. F. A. PICK-WORTH (Brit. Med. J., 1938, I, 265-272).-A review. C. A. K.

Amphibian ependymal secretory activity. K. PAPOUSCHEK (Z. mikr.-anat. Forsch., 1937, 42, 148-164).—Studies of the ependyma of brain and cord of various species of amphibians at different ages were made after appropriate careful fixing. Peculiar secretory activity was demonstrated. Gland-like tubular diverticulæ of ependyma under the floor of 4th ventricle were found in Bombinator. Cytoplasmic and intra-nuclear vacuoles, nuclear tears, and nuclear processes migrating to reach the lumen-facing cell border and extrusion of nuclear substance into the ventricle were seen. Transformation of ependymal cilia into secretion is suggested. J. H. G.

Micro-determination of glucose in cerebrospinal fluid. C. DUMAZERT and S. DONNAT (Compt. rend. Soc. Biol., 1937, 126, 948-950).-The method of Dumazert (A., 1935, 1518) has been applied to 1 c.c. of cerebrospinal fluid and has an accuracy of 2%. H. G. R.

Changes in the diastase content in denervated adipose tissue. F. X. HAUSBERGER (Z. ges. exp. Med., 1937, 102, 169-177).-The interscapular fat depot of mice contains more diastase after denervation. Fat synthesis and formation of glycogen are increased. A. S.

Effect of asphyxia and cocaine on nerves belonging to the nocifensor system. T. LEWIS (Clin. Sci., 1937, 3, 59-66).-Asphyxia of the skin prevents the development of hyperalgesia around a small crush, and a narrow band of asphyxia will block the spread of hyperalgesia. The duration of the asphyxia required has little effect on the sensory nerves of the skin. The effect is due to the paralysis of the nerves concerned, which are paralysed before the sensory nerves. Cocaine paralyses the pain and touch nerves before it interferes with the hyperalgesia reaction. These experiments support the idea that the "nocifensor" nerves belong to a special system; they are not sensory, though they belong to the posterior root system. A. N. D.

Double pain response of the human skin to a single stimulus. T. LEWIS and E. E. POCHIN (Clin. Sci., 1937, 3, 67-76).—The human skin is apparently supplied by pain nerves which have very different rates of conduction. They can be divided fairly sharply into a fast and very slow conducting group. A simple stimulus such as a

needle prick or heat may give two distinct pain responses, both of which are localised by the subject. A. N. D.

La Chirurgie de la Douleur. R. LERICHE (Masson et Cie., Paris, 1937, pp. 428, 13 figs.).-The chief interest of the book to physiologists is in the discussion of lesser-known painful syndromes, as indicated by the following chapter headings: "Diffuse post-traumatic neuralgia"; "Causalgia, its significance and treatment"; "Pains due to vaso-constriction"; "Pains in vaso-motor crises of nerves." Particular stress is lain on the rôle of the autonomic system in painful conditions. The author recognises two types of pain : (1) a fixed pain, without any symptom, outside the distribution of the affected nerve, susceptible to local but not to distant influence; (2) an unstable pain, accompanied by vasomotor and trophic disturbances and sometimes oculo-papillary phenomena and made worse by environmental changes, e.g., noise, draught, emotional upset. The first kind he calls "cerebro-spinal" and the second "sympathetic," according to the [alleged] afferent path of the impulses. P. B. A.

Die Irradiation Autonomer Reflexe. SCHWEITZER (S. Karger & Co., 1937, pp. viii + 376).—This clearly written, scholarly, and stimulating monograph reviews in a very interesting manner a branch of physiology and medicine which has developed rapidly in recent years and promises to be of increasing importance in the future. The conception of "irradiation" in somatic reflexes was clearly defined and its main laws were determined by the work of Sherrington. There has, however, been a reluctance to suppose that similar processes might take place within the autonomic nervous system. This book supplies a wealth of anatomical, experimental, and clinical evidence in support of this view. The most convincing experimental demonstration has been obtained from a study of the vasosensory nerves. Stimulation of the carotid sinus or aortic nerves by natural or artificial means not only leads to reflex changes in the circulation and respiration, but modifies secretion of glands, tone and movements of the bowel, tone and reflex activity of skeletal muscle, and even the balance between sleep and wake. These afferents thus produce a widespread irradiation of impulses in the central nervous system, influence many and separate somatic and autonomic centres, and alter the level of sympathetic and parasympathetic tone. The second part of the book gives a detailed and fully documented account of the effects produced by afferent impulses from various structures (skin, eyes, ears, respiratory apparatus, bowel, vascular system) on the viscera. A comprehensive bibliography of 40 pages is appended; there are 40 excellent illustrations. S. W.

Acetylcholine as a chemical transmitter of the effects of nerve impulses. I, II. H. H. DALE (J. Mt. Sinai Hosp., N.Y., 1938, 4, 401-415, 416-429).

Eosinophil and melanin granules in sympathetic ganglia. G. ROUSSY and M. MOSINGER (Compt. rend. Soc. Biol., 1937, 126, 1066).—The

ganglia of the sympathetic chain in adult man contain 6 types of cell according to their granules.

D. T. B. Synaptic connexions in the cœliac ganglia. A. KUNTZ (Proc. Soc. Exp. Biol. Med., 1937, 37, 445—446).—Section of both splanchnics and vagi and removal of the upper lumbar portion of the sympathetic chains caused degeneration of most axons going to the cœliac ganglion. Vagal section alone had very little effect, but section of the nerves between the ganglion and the stomach and intestine caused some degeneration in the proximal portion.

V. J. W.

Response of denervated ganglion to acetylcholine. F. T. VON BRÜCKE (J. Physiol., 1938, 91, 375—393).—Enhancement by preganglionic denervation of effects of acetylcholine on the mechanism which retracts the nictitating membrane (cat) appears to be adequately explained by the peripheral sensitisation to adrenaline and sympathin, without invoking enhanced response to acetylcholine of denervated ganglion cells; the latter are much more easily paralysed by acetylcholine than normal ganglion cells. J. A. C.

Phenolases and sympathetic excitation. Z. M. Bacq (Compt. rend. Soc. Biol., 1937, 126, 1268— 1271).—Tyrosinase from fungi and catecholoxidase from potato reverse the action of adrenaline, tyramine, and sympathetic stimulation on the frog's heart. An inhibitory substance adrenoxine is produced. D. T. B.

Effect of regeneration of the nerve supply on sensitivity of the denervated nictitating membrane to adrenaline. F. A. SIMEONE (Amer. J. Physiol., 1937, 120, 466-474).-Increased sensitivity of the cat's nictitating membrane to adrenaline was greater after post-ganglionic than pre-ganglionic denervation. The disappearance of this increased sensitivity was more rapid with pre-ganglionic than with post-ganglionic regeneration (2 weeks and 7 weeks, [respectively]). Regeneration took place more rapidly after crushing the nerve fibres than after cutting them. The evidence presented indicates that the increased sensitivity to adrenaline of the denervated nictitating membrane of the cat is not an irreversible change, but is lost when the nerves have regenerated. M. W. G.

Cervical sympathetic excitation liberates a vaso-constrictor substance in the adrenalectomised dog. H. HERMANN and F. JOURDAN (Compt. rend. Soc. Biol., 1937, 126, 1016—1019).— After removal of the adrenals, carotid body, and spinal cord in dogs, stimulation of the cervical sympathetic gives rise to vasoconstriction in the denervated kidney, which is attributed to sympathin. D. T. B.

Action on spleen of parasympathomimetics, parasympatholytics, and sympatholytics. A. B. CHAUCHARD and P. CHAUCHARD (Compt. rend. Soc. Biol., 1937, 126, 1171—1173).—Parasympathomimetics diminish the chronaxie of the spleen and summation time. Atropine and yohimbine increase these vals. D. T. B.

(g) SPECIAL SENSES.

Nature of the visual process. S. HECHT (Bull. N.Y. Acad. Med., 1938, 14, 21-45).

Introduction to Physiological Optics. J. P. C. SOUTHALL (Oxford University Press, 1937, pp. 426 + x).—This book forms a very good general introduction to the science of optics and vision. The author writes clearly and concisely, and mathematical symbols are used when necessary. Historical reference is frequent. The coloured plates and many illustrations are well drawn and reproduced. The volume covers adequately all the ground required in an introductory work for physicists, physiologists, opthalmologists, and illuminating engineers.

W. F. F.

Insensitivity of the cornea to heat and pain derived from high temperatures. J. P. NAFE and K. S. WAGONER (Amer. J. Psychol., 1937, 49, 631-635).-Using a mechanically supported, accurately adjustable, pointed brass wt. as the stimulator, the central part of the cornea was found to be sensitive to touch, pressure, and pain, to a degree which is dependent on the intensity of stimulation. It is also sensitive to itch. As the only free nerve endings are present in this area, it is concluded that all the forms of sensation enumerated are transmitted by these organs. The central part of the cornea is not sensitive to warmth, cold, heat, or, excluding injury, to pain aroused by heat; the last is attributed to spastic contraction of blood vessels and the nerve impulses consequently set up. G. W.

Binocular summation during dark adaptation. R. J. LYTHGOE and L. R. PHILLIPS (J. Physiol., 1938, 91, 427-436).—Monocular and binocular light thresholds were measured during the first 20 min. of dark adaptation for a white stimulus subtending $12\frac{1}{2}^{\circ}$ at eye. Binocular summation was found throughout 20 min. of dark adaptation for all 6 subjects and for both central and peripheral vision. Results are expressed by $1.4Th_{\text{Binoc.}} = \frac{1}{2}(Th_{\text{Right}} + Th_{\text{Left}})$. The binocular threshold is approx. the same as the monocular for test patch of area $\times 2$. J. A. C.

Absorption of infra-red by the media of the eye. C. LEGRAND and J. ROLLET (Bull. Acad. Méd., Paris, 1937, 118, 759—763).—Absorption of the infra-red part of the spectrum by the cornea, lens, aq. and vitreous humour was studied on freshly excised eyes of wethers and hares. The absorption coeffs. were determined and compared with that of water. The absorption coeff., in each case, decreases with increasing thickness of the absorbing medium. Infra-red rays are absorbed mainly by the cornea (75% of the applied intensity), and almost all the remainder by lens and vitreous body; only 0.5-1% reaches the retina. B. K.

Adrenaline and pigmentation of the iris. G. A. BENNETT and F. X. HAUSBERGER (Arch. exp. Path. Pharm., 1937, 188, 40—52).—The loss of pigmentation of the iris which develops in rabbits after extirpation of the superior cervical ganglion is prevented by adrenaline (1:1000, one drop 3 times daily), but not by atropine or eserine. H. O. S.

Presence of glutathione in the aqueous humour of the normal eye. A. CARTENÌ (Boll. Soc. ital. Biol. sperim., 1937, 12, 689—690).—Titrations with I and dichlorophenol-indophenol indicate that normal aq. humour (ox) contains very little or no glutathione. Cataract in rabbits gives an aq. humour with a reducing power greater than that due to the ascorbic acid present. F. O. H.

Behaviour of ascorbic acid and glutathione during naphthalene cataract. A. CARTENI and G. BASILE (Boll. Soc. ital. Biol. sperim., 1937, 12, 686-688).—The ascorbic acid and glutathione contents of the aq. humour and lens and the glutathione content of the lens (in rabbits) decrease, especially following the loss of opacity of the lens (cf. Nakashima, A., 1934, 691). F. O. H.

Experimental methods in the investigation of colour sense of bees. M. HERZ (Z. vergl. Physiol., 1937, 25, 239—250).—Some sources of error arising during experiments on the colour sense of bees are pointed out. "White" light, applied to the ultraviolet-sensitive eyes of bees, may produce a colour sensation if the ultra-violet part of the spectrum is missing. B. K.

Relation between loudness and masking. H. FLETCHER and W. A. MUNSON (Acoustical Soc. Amer. J., 1937, 9, 1—10).—Loudness and masking experiments are described and curves are drawn to show the extent of masking at different frequencies. A mathematical analysis is made on the assumption of a fundamental relation between loudness and intensity of stimulus per unit length of basilar membrane.

W. F. F.

Dependence of hearing impairment on sound intensity. J. C. STEINBERG and M. B. GARDNER (Acoustical Soc. Amer. J., 1937, 9, 11-23).-Hearing loss was measured in deaf persons for sound intensities well above threshold. Observers having a unilateral lesion balanced a tone heard with the deaf ear against one heard on the normal side. In some cases the impaired ear always heard less well than the normal, and in others tones well above the deafened threshold were heard equally well with either ear. On the assumption that these latter cases show nerve atrophy a quant. estimate is made of the deafness. The loudness characteristics of normal ears were extended to deaf ears. W. F. F.

Investigation of subjective tones by means of the steady tone phase effect. J. D. TRIMMER and F. A. FIRESTONE (Acoustical Soc. Amer. J., 1937, 9, 24—29).—Two pure tones of high intensity and of frequencies in harmonic relation, when heard together, have a character which depends on the phase relation between them. This was studied with tones up to 500 c.p.s. A new definition of the term "subjective tone" is given. W. F. F.

Empirical formula for loudness of a 1000-cycle tone. H. P. KRAUSS (Acoustical Soc. Amer. J., 1937, 9, 45-46).—The formula $L = I(10^{-5/2}I + 1)^{-2/3}$ is proposed, where L is the loudness in millisones and I is the intensity in units of 10^{-16} watt per sq. cm. This shows that for small I, L is proportional to I and for large I it is proportional to I^{13} . W. F. F.

Distortion in the ear as shown by the electrical responses of the cochlea. E. G. WEVER and C. W. BRAY (Acoustical Soc. Amer. J., 1938, 9, 227-233).—In the cat, a wave analysis is made of the electrical response of the cochlea recorded from the round window, with a pure tone stimulus of frequency 1000 c.p.s. at different intensity levels. For each of the different harmonic components of the response the logarithmic plot of response against the logarithm of the sound input is linear at the lower portion of the curve and bends over sharply at the upper part. A typical difference of slope was found between all even and all odd harmonics. The total harmonic content rose to over 50% of the fundamental at the highest input intensity used. In different preps. the tensor tympani tendon was cut, the muscle denervated, and reflexly contracted or put under tension artificially, but no changes were observed. The tensor tympani thus has little relation to the general pattern of distortion. The inner ear is suggested as the site of the distortion. W. F. F.

The monaural threshold : effect of a subliminal contralateral stimulus. J. W. HUGHES (Proc. Roy. Soc., 1938, B, 124, 406-420).-Direct experimental determinations of the change in threshold intensity in one ear when a note of fixed subliminal intensity is sounded in the other show that for two notes in unison, the total energy required in the two ears at the "binaural threshold" is equal to the energy required in one ear at the monaural threshold, independently of the actual division of energy between the two ears. For two notes of different frequencies, the result still holds good in the form $(E_1/E_0)_R$ + $(E_1/E_0)_L = 1$, where \breve{E}_0 is the monaural threshold intensity, and E_1 the intensity of the note present in the same ear at the binaural threshold, the subscripts R and L referring to the two ears. Results are discussed with reference to their bearing on the theory of hearing. F. B. P.

Recent advances in knowledge concerning hearing and speech. P. M. T. KERRIDGE (Physiol. Rev., 1938, 18, 59–85).

Aural vertigo : effect of injection of adrenaline and pituitrin. C. FRANCIS (Proc. Roy. Soc. Med., 1937, **31**, 102).—The patient was a female who for 3 years had been subject to periodical attacks of tinnitus in the left ear, accompanied by nausea and vomiting. On two occasions these attacks, which were associated with vasomotor disturbance, were relieved by subcutaneous injection of 0.5 c.c. of a prep. containing 0.15 unit of posterior pituitary extract and 0.5 c.c. of liq. adrenal. hydrochlor. B.P. per c.c. A further dose on the following day was necessary.

W. J. G.

"Electric taste" from alternating currents. Z. BUJAS and S. CHWEITZER (Comp. rend. Soc. Biol., 1937, 126, 1106—1109).—Alternating electric currents evoke different tastes when applied to the tongue. It is acid with low frequency and intensity, bitter with high frequency and intensity.

D. T. B.

Relationship between taste and constitution of dihydrazides of alkylmalonic acids and their derivatives.—See A., II, 86. New pallial sense-organs in early fixed stages of Ostrea edulis. H. A. COLE (Nature, 1938, 141, 161).—New sense-organs in the spat of the oyster are described. They may react to vibrations in the surrounding medium. C. A. K.

(h) DUCTLESS GLANDS, EXCLUDING GONADS.

Physiology of the thymus. J. G. COHEN, H. SHAY, S. S. FELS, T. MERANZE, and D. MERANZE (Science, 1938, 87, 20).—The thymus gland was destroyed by X-rays in 48-hr. old rats of both sexes. In males, testicular development was practically arrested, with almost complete disappearance of the germ cells; the pituitary showed the typical castrate picture. In females there were no significant changes. C. A. K.

Thymus and lymphatic system. F. KLEIN (Klin. Woch., 1937, 16, 820—822).—Injection of pregnancy urine increased the wt. of the guineapig spleen owing to hyperplasia of the pulp; the Malpighian bodies are diminished. The lymphatic glands were unaltered but the thymus atrophied. In males the effects were less marked. F. W. L.

Mechanism of disturbances of thyroid function in man. A. BOEGER and K. WEZLER (Z. ges. exp. Med., 1937, 102, 134—168).—Cardiac output is always increased in thyrotoxicosis; the peripheral resistance is diminished. The arterial-venous O_2 difference is sometimes reduced to half. In myxcedema the reverse occurs. The changes in the circulation in thyrotoxicosis are similar to those produced by adrenaline in normal subjects. A. S.

Action of vitamin- B_1 in experimental hyperthyroidism. A. W. ELMER, B. GIEDOSZ, and M. SCHEPS (Comp. rend. Soc. Biol., 1937, 126, 1037— 1038).—Vitamin- B_1 injected intraperitoneally in guinea-pigs does not affect the thyrotropic action of anterior pituitary. D. T. B.

Relation between endemic goitre in the Jehol district and the iodine content of the principal food produced in that district. U. TAKEI (J. Oriental Med., 1937, 27, 134—136).—The I content of vegetables and cereals in the affected area is subnormal. P. C. W.

Influence of denervation on the metamorphosis of axolotls under thyroxine. F. X. HAUSBERGER (Arch. exp. Path. Pharm., 1937, 186, 326—328).— The absorption of the gills of axolotls under the influence of thyroxine is unaffected by denervation of the area. T. B. H.

Effect of thyroxine on carbohydrate metabolism of hypophysectomised rats. J. A. RUSSELL (Proc. Soc. Exp. Biol. Med., 1937, 37, 569–570).— Hypophysectomised rats were given 10–20 μ g. of thyroxine daily for 10 days. When given glucose subsequently they absorbed it as completely as normal rats but the proportions stored and oxidised were the same as if no thyroxine had been given.

V. J. W.

Thyroidectomy in heart disease. M. BÉRARD (Presse méd., 1938, 102—106).—A crit. review. P. C. W.

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Hyperthyreosis and thyrotropic hormone, A. LOESER (Klin. Woch., 1937, 16, 913—917).—A review. F. W. L.

Quantitative micromorphology of the adrenal gland. H. CARLSON, B. GUSTAFSSON, and K. L. Möller (Uppsala LäkFören. Förh., 1937, 43, 49-82). -Differences in the adrenals of male and female adult white mice are described. The wt. and vol. are significantly greater in the female owing solely to the greater size of the cortex. The no. of cortical parenchyma cells, their vol., surface area, and secretory capacity, and the proportion of parenchyma are greater in the female. In the medulla no significant differences were observed. The wt. of the male cortex is positively correlated with the body-wt., but no relationship exists in the female. In neither sex was there correlation between medulla wt. and body-wt. There was positive correlation between cortex and ovary wt., but not with the no. of pregnancies. Histological differences in the adrenals of the two sexes as well as of pregnant and non-pregnant T. S. G. J. animals are described.

Aberrant adrenal cortex in the parietal peritoneum of the horse. L. BLANCHARD (Compt. rend. Soc. Biol., 1937, **126**, 1120—1122).—Adrenal cortical tissue is found in the parietal peritoneum of the horse, more frequently in mares. Common sites are the anterior face of the kidney and the ovarian ligament. D. T. B.

Chemistry of cortin and related substances. T. REICHSTEIN (Ergebn. Vitamin- Hormonforsch., 1938, 1, 334—370). A. S.

Functions of adrenal cortex and Addison's disease. O. RIESEL (Klin. Woch., 1937, 16, 801—804).—A dialysate of serum from adrenalectomised rabbits suffering from severe muscular weakness produced toxic signs and death within 48 hr. when injected into guinea-pigs. The adrenals were hypertrophied and engorged with blood. Simultaneous injection of cortin prevented these phenomena.

Muscular work and adrenal cortex. O. RIML (Arch. exp. Path. Pharm., 1937, 188, 35—39).— Dialysed serum of patients suffering from tetanus produces a 28% increase in the average wt. of guineapigs' adrenals and histological changes resembling those seen in the patient's own adrenals. The control animals were injected with the serum of patients suffering from various other diseases. H. O. S.

Adrenal cortical tumours; report of four cases. C. H. LAWRENCE (Ann. intern. Med., 1937, 11, 936-948).—4 cases showing the adrenal cortical syndrome are described; 3 of the cases (females) were shown at operation or post mortem to have adrenal cortical tumours, there being no definite evidence of pituitary abnormality. One case (a boy) was found post mortem to have a pituitary adenoma with hypertrophy of the adrenal cortex.

C. A. K. Hair growth in adrenalectomised and adrenalectomised-thyroxine-treated rats. E. O. BUT-CHER (Amer. J. Physiol., 1937, 120, 427-434)... The second growth of hair in the normal immature P (A., III.) rat appears externally on the dorsum about the 38th day; when the rats are bilaterally adrenalectomised on the 22nd day, the hair grows about 4 days sooner. Administration of 0.1 mg. of thyroxine on the 21st, 22nd, and 23rd days after adrenalectomy induces hair growth sooner than adrenalectomy alone. A much earlier and greater administration of thyroxine is necessary to produce a similar effect in the normal animal. M. W. G.

Sodium chloride in adrenalectomy. E. MAR-GITAY-BECHT and L. BINDER (Arch. exp. Path. Pharm., 1937, 186, 96—106).—The desiccation of tissues and fall in Na content of animals (cats) following adrenalectomy are not so great as has been found in various other non-fatal clinical conditions; they cannot therefore be regarded as the sole or immediate causes of death. T. B. H.

Fate of zona reticularis in adrenal cortex of castrated male mice. K. TAKEWAKI (Proc. Imp. Acad. Tokyo, 1937, 13, 368—370).—In 8 mice castrated at 1 month the zona reticularis persisted for 9 to 18 months. W. F. F.

Effects of castration and of sexual hormones on adrenals of male rats. K. HALL and V. KORENCHEVSKY (J. Physiol., 1938, 91, 365—374).— Castration produces hypertrophy and increase in vacuolation of cells of zona fasciculata and reticularis; male sexual hormones cause return to normal but in large doses give evidence of toxicity. [Illust.]

J. A. C.

Adreno-secretory action of acetylcholine. H. HERMAN, F. JOURDAN, G. MORIN, and J. VIAL (Arch. int. Pharmacodyn., 1937, 57, 403—439).—An adrenaljugular anastomosis was carried out between a vagotomised and atropinised donor dog and a cordless dog. Acetylcholine injected into the former causes hypertension in the latter owing to adrenaline secretion. Atropine has a synergic effect, and eserine increases the secretory action of acetylcholine on the adrenal.

D. T. B.

Epinephrine output from the adrenal glands in experimental diabetes. J. M. ROGOFF and E. N. DIXON (Amer. J. Physiol., 1937, 120, 440— 445).—Suppression of adrenaline secretion does not influence the development, intensity, or course of diabetes following pancreatectomy. Diabetic animals with intact adrenals develop reduced or suppressed secretion of adrenaline, which is due primarily to the diabetic state. Stimulation of the splanchnic nerve may increase the adrenaline output up to or above normal level in a nimals with a very low adrenaline output. M. W. G.

Electrical changes in the adrenal after nicotine. B. HASAMA (Arch. exp. Path. Pharm., 1937, 186, 25-32).—From a unipolar lead on the adrenal of the guinea-pig a monophasic negative electrical variation is obtained after intravenous nicotine injection, lasting 1-2 min., which is about the period of increased adrenaline production. This occurs after section of the sympathetics or administration of ergotamine. T. B. H.

Acetylation of insulin by keten.—See A., II, 108.

F. W. L.

Action of hydrochloric acid on insulin. R. NETTER and S. ROCHE (Compt. rend., 1937, 205, 934—935).—HCl added to aq. insulin at 5° affords a ppt. which possesses all the activity of the original solution (cf. A., 1923, i, 967). Aq. cryst. insulin to which HCl is added to give N-HCl gives a ppt., of which 0.05 mg. is equiv. to one international unit. The ppt., unlike insulin, affords no ppt. in 0.7% NaCl at $p_{\rm H}$ 2 at 80°. J. L. D.

Protamine zinc insulin. H. O. MOSENTHAL (J. Amer. Med. Assoc., 1938, **110**, 87–90).—A discussion on the results of treating diabetic patients with protamine Zn insulin. R. L. N.

Difficulties in the use of protamine zinc insulin. E. P. JOSLIN (J. Amer. Med. Assoc., 1938, 110, 90—91).—A consideration of cases of diabetes where the use of regular insulin has been preferred to protamine Zn insulin. R. L. N.

Clinical experience with protamine zinc insulin. E. J. KEPLER (J. Amer. Med. Assoc., 1938, 110, 92—95).—The clinical management of diabetes with protamine Zn insulin is discussed. R. L. N.

Control of intractable clinical and of total experimental diabetes with protamine insulin. W. H. NADLER and B. L. ISAACS (J. Lab. clin. Med., 1937, 23, 241—251).—6 patients with severe diabetes, never adequately controlled with insulin, responded favourably to protamine insulin. In 3 of these aglycosuria was maintained almost continuously for 6 to 8 months. 4 of 5 depancreatised dogs were satisfactorily maintained by protamine insulin. No harmful local effects follow daily injections of protamine insulin at the same site. T. H. H.

Effect of zinc insulin. J. CLAUSEN, V. CLAUSEN, and L. HANSEN (Acta med. scand., 1937, 93, 150— 167).—Addition of $ZnSO_4$ to insulin slows the onset of the effects, which last longer (4 rabbits, 4 normals, and 16 diabetics tested). This protraction is gradual and becomes more pronounced with increasing Zn concn. due to the slower absorption of the injected compound. Similar protraction is observed if Zn is added to protamine insulin. C. A. A.

Clinical use of crystalline insulin. S. S. ALTSHULER (Ann. intern. Med., 1937, 11, 901—905).— Cryst. insulin was given to 100 diabetic patients for one year. None required more than 2 doses daily; insulin reactions were rare and slight, lower bloodsugar levels were obtained without reaction, and no local reactions were observed. Lipodystrophy, produced in 3 patients when on standard insulin, was not seen with the cryst. form. C. A. K.

Recent advances in insulin treatment. H. C. HAGEDORN (Schweiz. med. Woch., 1938, 68, 39–41). —A review. A. S.

Action of insulin. L. POLLAK (Klin. Woch., 1937, 16, 887—892).—The peripheral action of insulin was investigated by injecting white rats with galactose, and determining the partition coeff. between blood and different organs. Insulin produces an increased absorption in the heart and diaphragm, especially in the former. Iodoacetic acid inhibits the process. F. W. L. Unusual complication of insulin shock (hypoglycæmic) therapy. C. B. MOLONY and M. S. HONAN (J. Ment. Sci., 1937, 83, 630-635).—On the 22nd day of treatment, after receiving 40 units of insulin, the patient did not awake from coma on glucose administration. She was in a state resembling diabetic coma for some days, with high blood-sugar (up to 280 mg. per 100 c.c.). Cerebrospinal fluid-sugar (up to 360 mg. per 100 c.c.) was often twice blood-sugar. The patient finally recovered with anti-diabetic reatment. G. D. G.

Hyperinsulinism. E. ZISKIND and W. A. BAY-LEY (J. Lab. clin. Med., 1937, 23, 231—240).—A case of hyperinsulinism due to pancreatic islet cell adenoma was investigated. 1.5 g. of glucose per kg. body-wt. per hr. was required to maintain a const. blood-sugar level of 90 mg.%. Prolonged exercise lowered the blood-sugar. T. H. H.

Pancreatitis and diabetes. H. O. MOSENTHAL (Ann. intern. Med., 1937, 11, 1001—1012).—From clinical and pathological studies it is concluded that some form of pancreatitis occurs in nearly all cases of diabetes. C. A. K.

Pancreotoxin treatment in diabetes mellitus. G. P. SAKHAROFF and D. M. ROSSIISKY (Acta med. scand., 1937, 93, 239—247).—The serum of animals, immunised against human pancreas (pancreotoxin), when injected in small amounts into diabetics (50 cases) caused improvement in the general condition, with decrease and sometimes disappearance of polydipsia and polyuria. Sugar disappeared completely from the urine in some cases and decreased in all. A higher carbohydrate tolerance was obtained without the continued use of insulin. C. A. A.

L'Innervation de la Glande Pituitaire. R. Collin (Hermann et Cie., Paris, 1937, pp. 90).—A useful review with full references. R. L. N.

Leçons Cliniques sur les Affections Hypophysaires. L. LANGERON (Masson & Cie., Paris, 1937, pp. 221).—The clinical features of some of the more uncommon pituitary disturbances are described. R. L. N.

Morphogenetic activity of different parts of the pituitary. A. A. VOITKEVITSCH (Compt. rend. Acad. Sci., U.R.S.S., 1937, 17, 157—160).—Feather production in birds is accompanied by considerable thyroid activity and is inhibited by removal of the gland. Administration of thyroid hormone to thyroidectomised birds accelerates feathering. Implantation of the basophil zone of cow pituitary in pigeons stimulates thyroid activity and accelerates moulting and re-feathering. The effect of the eosinophil zone is less definite. A. G. P.

Relationship between pituitary gland and gonads. W. BERBLINGER (Ergebn. Vitamin-Hormonforsch., 1938, 1, 191–212). A. S.

Differentiation of two classes of acidophils in the anterior pituitary of the female rabbit and cat. A. B. DAWSON and H. B. FRIEDGOOD (Stain Tech., 1938, 13, 17-21).—A method of staining the anterior pituitary is described which differentiates two types of acidophils (one staining selectively with azocarmine) in the female rabbit and cat.

E. M. W.

Chemistry of the hormones of the posterior lobe of the pituitary gland. R. L. STEHLE (Ergebn. Vitamin- Hormonforsch., 1938, 1, 114-139).-

Interaction of pituitary, thyroid, and adrenal cortex. J. DIECKHOFF and E. SCHULZE (Arch. exp. Path. Pharm., 1937, 186, 462-474).-A relationship between anterior pituitary, thyroid, and adrenal cortex is indicated by the action of diphtheria toxin, which influences the thyroid by diminishing production of thyrotropic hormone. This action can be mitigated by administration of ascorbic acid and cortical extract. T. B. H.

Influence of cattle anterior pituitary extract on endochondral ossification in young ovariectomised guinea-pigs. M. SILBERBERG and R. SILBER-BERG (Proc. Soc. Exp. Biol. Med., 1937, 37, 446-450).—In the growing guinea-pig, ovariectomy causes hypertrophy of the epiphyseal cartilages but no acceleration of ossification, so leading to increased length of bones. This effect is opposed by an acid extract of anterior pitiutary which tends to cause calcification of cartilage. V. J. W.

Gonadokinetic effects in parabiotic rats. E. CUTULY and E. C. CUTULY (Proc. Soc. Exp. Biol. Med., 1937, 37, 477-480).—If one of a parabiotic pair of male rats is hypophysectomised its sexual organs are maintained in normal activity and grow more effectively if the partner is castrated than if it is intact or cryptorchid. The size of the testes can be taken as indicative of the activity of the gametic cells and the size of the scrotum of the activity of the interstitial cells; both are equally influenced by the pituitary of the castrated partner. V. J. W.

Pro-gonadotropic sera. I. W. ROWLANDS (Proc. Roy. Soc., 1938, B, 124, 492-503).-After a course of injections of extract of sheep pituitary, a sheep's serum had no antigonadotropic activity, but augmented the activity on test rats of an extract prepared from the same species. The increase in ovarian growth of the immature rat produced by pig, sheep, and ox pituitary extracts was augmented by the serum of a goat injected with pig pituitary extract. The same serum inhibited both the ovulation-producing activity of the same extract of pig pituitary in the cestrous rabbit, and also the gonadotropic action on the rat ovary of extracts of horse pituitary, pregnant mare serum, and human pregnancy urine. It is suggested that this augmentatory action may be explained by reference to Evans' pituitary F. B. P. antagonist.

Specificity of antigonadotropic sera. I. W. RowLANDS (Proc. Roy. Soc., 1938, B, 124, 503-521).-Antisera were prepared (all in rabbits, except one, in a goat, to extract of pregnancy urine) to gonadotropic extracts of ox pituitary, horse pituitary, human urine of pregnancy, and pregnant mare serum. Their activity was tested by their inhibition of the effects on immature rats and œstrous rabbits of gonadotropic extracts of horse, ox, sheep, pig, and human pituitaries,

human and mare pregnancy serum, and human pregnancy urine and placenta. Antisera to gonadotropic extracts of human and mare pregnancy urine show complete "species-specificity," *i.e.*, their neutralising action is limited to the particular species yielding the immunising extract. Antisera to similar extracts of pituitary origin show incomplete " speciesspecificity." Only the antiserum to gonadotropic extracts of pregnant mare serum shows complete "source-specificity," i.e., neutralising action limited to the particular organ of fluid yielding the extract. More evidence is necessary before the specificity of antigonadotropic sera can be ascribed to immunological factors. F. B. P.

Effects of splenectomy on pituitary gonadotropic substances. F. E. EMERY (Proc. Soc. Exp. Biol. Med., 1937, 37, 455-457).-No differences were found between splenectomised and normal female rats in their responses to pituitary grafts. V. J. W.

Luteinising hormone in bird hypophyses. S. L. LEONARD (Proc. Soc. Exp. Biol. Med., 1937, 37, 566-568).-Dried chicken pituitaries, ground up and suspended in water, were injected into immature, normal and hypophysectomised rats. Follicle stimulation and luteinisation took place as with mammalian hypophysis, and, when the chick pituitary was given with an extract of follicle-stimulating urine, ovarian hypertrophy took place to a greater degree than either would produce separately. V. J. W.

Treatment of dystrophia adiposo-genitalis with gonadotropic hormone from the urine of pregnant women. P. PLUM (Acta med. scand., 1937, 93, 65-83).-Treatment of dystrophia adiposogenitalis (5 cases under 13 years of age) with hormones from pregnancy urine gave marked growth of the genitals in 6—8 weeks. Thyroid therapy also was necessary to produce changes in metabolism or distribution of fat. In one case with cryptorchidism, but no endocrine disturbance, the testes did not descend in 2 months, although there was marked genital growth. In another in which adiposity and decreased metabolism were present, descent of the testes occurred in 2 weeks. C. A. A.

Rôle of pituitary in development studied in cyclocephaly in the chick. E. WOLFF and R. STOLL (Compt. rend. Soc. Biol., 1937, 126, 1215-1217).-In experimental cyclocephaly there is agenesis of the pituitary in chick embryos. They develop to term but fail to emerge. The other endocrine glands evolve normally. D. T. B.

Effect of posterior lobe hormone on colour changes in fish. W. FLEISCHMANN and S. KANN (Z. vergl. Physiol., 1937, 25, 251-255).-In some fish (Adriatic sea) injection of posterior lobe preps. causes deepening of colour, due to the expansion of erythrophores, xanthophores, and cyanophores.

B. K. Intermedin content of catfish. C. VEIL (Compt. rend. Soc. Biol., 1938, 127, 42-43).-1 µg. of ox intermedin per 100 g. body-wt. restores the normal dark colour to hypophysectomised catfish.

Simultaneous action of adrenaline and intermedin on the melanophores of the carp. C. VEIL (Compt. rend. Soc. Biol., 1938, 127, 44—46).— Adrenaline added to a dil. solution of ox intermedin causes as much (or more) contraction of the carp's melanophores as adrenaline alone. D. T. B.

Lactogenic and thyrotropic hormone content of the anterior pituitary. R. P. REECE and C. W. TURNER (Missouri Agric. Exp. Sta. Res. Bull., 1937, No. 266, 104 pp.).-Lactogen is determined by means of its action in causing proliferation of the crop gland in pigeons. Vals. for pituitaries of female were higher than those for male animals, showed characteristic species-difference, and varied with the stage of the œstrous cycle, with age, and during pregnancy. Lactogen contents of female rat pituitaries were lowered by ovariectomy, but those of male pituitaries were unaffected by castration. Injection of æstrogens into ovariectomised or castrated and normal male rats diminished lactogen in pituitaries; injection of progestin had no effect. Heavy injection of thyroxine decreased the size of the pituitary and its lactogen contents in male rats. Data for cows and bulls under varying conditions are recorded. A. G. P.

Massive Rcentgen irradiation of the hypophysis in experimental diabetes. J. B. JOHNSON, W. A. SELLE, and J. J. WESTRA (Amer. J. Rcentgenol., 1938, **39**, 95—102).—In seven depancreatised dogs the hypophysis was irradiated with X-rays in massive doses. No increased sensitivity to insulin was found and it was not possible to deduce the dose of insulin necessary to prevent glycosuria. The response to injected glucose was typical of severe diabetes. W. F. F.

Action of anterior pituitary extracts on pancreas. G. ROUSSY and M. MOSINGER (Compt. rend. Soc. Biol., 1937, 126, 1064—1066).—Anterior pituitary extracts injected into guinea-pigs produce histological changes in the pancreas. D. T. B.

Relation of hypophysis to changes in sugar tolerance and insulin-sensitivity induced by changes in diet. H. P. HIMSWORTH and D. B. MCNAIR SCOTT (J. Physiol., 1938, 91, 447-458).— Impairment of sugar tolerance and of insulin-sensitivity in rabbits resulting from administration of a lowcarbohydrate diet may be explained by such a diet stimulating the hypophysis to secrete in increased amounts a substance identical with or similar to Young's glycotropic factor; other factors may also be concerned. J. A. C.

Disorders of internal gland secretion in children. F. B. TALBOT and N. B. TALBOT (J. Pediat., 1938, 12, 103-111).—A crit. review.

C. J. C. B.

Relations between activity of hormones and their chemical constitution. L. RUZICKA (Chim. et. Ind., 1937, 38, 1059—1072).—A review dealing with rôle, isolation, classification, specificity, and formation in the organism of adrenaline, thyroxine, insulin, male and female sex hormones, and plant hormones. J. N. A.

Endrocrine control of amphibian metamorphosis. B. M. ALLEN (Biol. Rev., 1938, 13, 1-19).

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Relationships of sex hormones to infection. D. H. SPRUNT, S. MODEARMAN, and J. RAPER (J. Exp. Med., 1938, 67, 159—168).—Injection of æstrogenic hormones in castrated rabbits decreased the spreading of Indian ink in the skin, diminished the rate of removal of saline injected into the skin, and prolonged the wheal disappearance time. Castrated rabbits injected with æstrogenic hormone for 3 weeks prior to inoculation showed increased resistance to vaccinia. Gonadotropic hormone gave variable results. A. C. F.

Influence of male and female hormones on the structure of the penis. A. RAYNAUD and A. LACASSAGNE (Compt. rend. Soc. Biol., 1937, 126, 868—871).—Œstrone arrests development of the prepuce and glans of the mouse penis. This effect is reversed by male hormone. D. T. B.

Seminal fluid. II. $p_{\rm H}$ of cock's seminal fluid. V. ZAGAMI (Atti R. Accad. Lincei, 1937, [vi], 26, 123-128; cf. A., 1937, III, 377).—The $p_{\rm H}$, normally 7.02—7.18 at 18°, is increased by repeated copulation and (to 7.60—7.80) by exposure (3—4 hr.) to the air. F. O. H.

Chemistry of male sex hormones. M. W. GOLDBERG (Ergebn. Vitamin- Hormonforsch., 1938, 1, 371-418). A. S.

Increased activity of the male sexual hormone on esterification. K. MIESCHER, H. KÄGI, C. SCHOLZ, A. WETTSTEIN, and E. TSCHOPF (Biochem. Z., 1937, 294, 39-60).-A table summarises the m.p. and pharmacological activity of 32 esters of androsterone, androstane-3-cis-17-trans-diol, dehydrotestosterone, and testosterone. In capons, the activity of the esters decreases with increasing chain length of the acid residue but the duration of the action increases. Benzoylation in position 17 destroys the activity. In the rat, the esters show increase in both intensity and duration of action (except in the androsterone esters). Of the new esters, those of androsterone are least active, of androstanediol somewhat more active, and of dihydrotestosterone most active. To attain max. effects, the maintenance of a concn. for a considerable time is more important than overdosing. (For new compounds see A., 1938, II, 104.) P. W. C.

Activation of testosterone by higher fatty acids and their acid sodium salts. M. EHRENSTEIN and E. L. COREY (J. Biol. Chem., 1938, **122**, 297–302).— Daily doses of 50 μ g. of testosterone were given in 0.5 c.c. of sesamé oil containing also palmitic or stearic acids or their acid Na salts (25–75 mg.), the latter being more effective than the free acids. Such mixtures were biologically more active than equal doses of the free hormone or its acetate or propionate. P. G. M.

Pharmacological ejaculation test for bio-assay of male sex hormone. S. LOEWE (Proc. Soc. Exp. Biol. Med., 1937, 37, 483–486).—Castrated male mice were injected for 5 days with measured amounts of the hormone and the regeneration of their accessory genital organs was estimated by the occurrence of ejaculation when they were injected with 83 mg. per kg. of pernostone followed by 10 mg. per kg. of yohimbine sulphate. The relative potencies of androsterone, testosterone, and testosterone propionate were 1, 62, and 200. V. J. W.

Use of colchicine to demonstrate stimulating action of testosterone on vesiculæ seminales. P. BASTENIE and S. ZYLBERSZAC (Compt. rend. Soc. Biol., 1937, 126, 891—892).—The use of colchicine enables the stimulating action of testosterone propionate on the vesiculæ seminales of the rat to be demonstrated by revealing multiple epithelial mitoses. D. T. B.

Local action of sex hormones. H. Voss (Klin. Woch., 1937, 16, 769—771).—The ratios of capon comb units of male hormone estimated (1) by local application and (2) by intramuscular injection were: testosterone 1:5 to 1:10; dihydroandrosterone 1:20 to 1:25; *iso*androsterone 1:30 to 1:40; androsterone 1:35; *iso*alihydroandrosterone 1:35 to 1:85; androstenedione 1:90 to 1:450. F.W.L.

Genesis of the testicular hormone.—See A., II, 104.

Action of the sex hormones on the inversion of the sex of Xiphophorus helleri, Heckel. M. T. REGNIER (Compt. rend., 1937, 205, 1451-1453).-Histologically the gonads during the normal life cycle are at first paired and undifferentiated; then there is an unpaired ovary. Some animals after ovarian degeneration develop testicles. There are associated changes in the genitalia. Adult females given intramuscular injections twice weekly of testosterone propionate (0.5 mg.) in oil show in less than 4 weeks degenerative changes in the ovary but the changes are different from those which occur in the spontaneous development of males from Testosterone causes the resorption of early females. fœtuses; later fœtuses are born with abnormal gonads due to the action of the hormone. Immature individuals treated with testosterone show the characteristic macroscopic changes associated with the development of the male fish. Mashed or powdered bull or horse testicle added to the aquarium gives analogous results, though more slowly. Estrin inhibits the female \rightarrow male change which has begun J. L. D. spontaneously.

Intersexuality caused by injection of male hormone in pregnant mice. A. RAYNAUD (Compt. rend. Soc. Biol., 1937, 126, 866—868).—Injection of testosterone propionate on the 13th day of gestation in mice caused persistence of the Wolffian ducts and development of male glands in the urogenital sinus of female embryos. D. T. B.

Rôle of hypophysis and thyroid in intersexual development of the chick. E. WOLFF (Compt. rend. Soc. Biol., 1937, 126, 1217—1219).—In agenesis of hypophysis and thyroid (in triocephaly) injection of female hormone determines intersexuality by direct action on the genital sphere. D. T. B.

Histological study of the genital tract of female mice transformed experimentally into freemartins. A. RAYNAUD (Compt. rend., 1937, 205, 1453-1456).-Females in the litters of mice treated, during gestation, with testosterone propionate show normal generative tissue in the gonads, a well developed Wolffian system corresponding with the rete testis, and structures resembling the epididymis and vas deferens. Oviducts and a uterus (with two ventral diverticulæ which have no counterpart in the male) which is divided into two cavities each of which communicates with a diverticulum of the urogenital sinus, are also found. The oviducts encircle, but do not open into, the uterus and show glandular diverticulæ corresponding with the seminal vesicles; they open into the urogenital sinus beneath the uterine openings. The sinus at this level gives off diverticulæ corresponding with the prostate and leads into a urethra of the male type. J. L. D.

Correlation of left ovary, right gonad, and mesonephros in chick embryo injected with testosterone. V. DANTCHAROFF (Compt. rend. Soc. Biol., 1937, **126**, 1191—1193).—Injection of testosterone in female chick embryos causes conflict with the hormone of female determination. The left ovary best resists testosterone, the right gonad becomes rudimentary, of somewhat indifferent sexual type, and the mesonephros forms an epididymis on each side. D. T. B.

Effect of testosterone propionate on gonadotropic hormone excretion and vaginal smears of human female castrate. U. J. SALMON (Proc. Soc. Exp. Biol. Med., 1937, 37, 488—491).—Administration over 27 days of a total amount of 815 mg. of this hormone caused the disappearance of gonadotropic hormone from the patient's urine and the appearance of cornification in the vaginal smears. V. J. W.

Equilin and its hydrogenation.—See A., II, 102.

Chemical researches on the physiological specificity of the genital hormones. A. BUTE-NANDT (Bull. Soc. Chim. biol., 1937, 19, 1477—1497).—A lecture.

Chemistry of the œstrogenic hormones. G. F. MARRIAN (Ergebn. Vitamin- Hormonforsch., 1938, 1, 419-454). A. S.

Ovarian weight responses to menopause urine injections in normal, hypophysectomised, and hypophysectomised thyroxine-treated immature rats. H. H. TYNDALE and L. LEVIN (Amer. J. Physiol., 1937, 120, 486—493).—Doses of menopause urine extract which gave marked follicular enlargement and little or no grossly observable luteinisation in the immature rat ovary produced much heavier ovaries in hypophysectomised animals than in unoperated controls. This shows that an inhibitory factor is operative in the normal animal, probably the greater activity of the thyroid gland. Ovarian follicle stimulation induced by extracts of menopause urine in hypophysectomised rats was markedly decreased by the simultaneous injection of thyroxine. M. W. G.

Use of colchicine to demonstrate hypophyseal action on genital tract. P. BASTENIE and S. ZYL-

BERSZAC (Compt. rend. Soc. Biol., 1937, **126**, 1282— 1283).—Colchicine is less satisfactory for demonstrating anterior pituitary action on the uterine horn of the immature guinea-pig than on the thyroid. D. T. B.

Effect of caffeine on ovarian function. H. WEISS (Arch. exp. Path. Pharm., 1937, 186, 33-42). —No effect is found on the cestrous cycle of white rats after administration of caffeine, unless this is given in very large doses, equiv. to about 50 cups of strong coffee for man. T. B. H.

Evaluation of follicular hormone preparations. B. BEHRENS, W. HEUBNER, W. KOLL, and F. KÜLZ (Arch. exp. Path. Pharm., 1937, **186**, 121–160).— Rats and mice are used for the comparison and standardisation of various preps. of follicular hormone, the standard being the dose required to produce full cestrus in 50% of the animals. Certain differences exist between rats and mice, but the method is satisfactory with both, except that in some cases the preps. gave rise to wide fluctuations as compared with the standard; in these cases the fluctuations were much greater with rats than with mice. T. B. H.

Detection and determination of the hormone of corpus luteum. P. HOLTZ and K. WÖLLPERT (Arch. exp. Path. Pharm., 1937, 186, 475-481).--(Estrus which develops in immature or castrated guinea-pigs after administration of follicular hormone can be abolished by giving active luteal extracts. The guinea-pig in 33 times as sensitive as the rabbit, and may be used for the standardisation of luteal hormone. One guinea-pig unit of hormone is present in 12 c.c. of blood from the 2nd month of pregnancy, or in 12 c.c. of urine from a newly-born infant. T. B. H.

Gonads of toad tadpoles (*Bufo vulgaris*) treated with follicular hormone. E. PADOA (Boll. Soc. ital. Biol. sperim., 1937, 12, 656–657).—The ovarian development of the tadpoles is significantly inhibited as indicated by the subnormal size of Bidder's organ and no. of the germinal cells. F. O. H.

Female sex hormones and gaseous metabolism. I. Prolan. II. Corpus luteum hormone. C. ARTOM and F. CACIOPPO. III. Folliculin. R. PIZZOLO (Boll. Soc. ital. Biol. sperim., 1937, 12, 703-705, 705-707, 707-708).—I. Injection of approx. 100 units per kg. of prolan (from urine of pregnancy) lowers the gaseous metabolism of pigeons by approx. 25%, the effect persisting for 2-8 days. II. Injection of the hormone (0·3-0·7 unit per kg.) lowers the gaseous metabolism of pigeons by 25-60%, the effect persisting for 5-10 days.

III. Injection of folliculin has no effect on the gaseous metabolism of pigeons. F. O. H.

Lipoid substances of ovary during ova production in Rana pipiens. E. M. BOYD (J. Physiol., 1938, 91, 394—397).—These are increased 200—270%. J. A. C.

Influence of sarcomatous graft on œstrus. L. HALBERSTAEDTER and A. BACK (Compt. rend. Soc. Biol., 1937, 126, 1117—1119).—Grafting of a sarcoma into white rats inhibits œstrus; excision of the growth restores the normal cycle. D. T. B.

Difference of hypophyseal reaction to cestrogenic substances in different breeds of mice. A. LACASSAGNE and W. NYKA (Compt. rend. Soc. Biol., 1937, 126, 1112—1115).—I mg. of cestrin weekly injected into young mice produces different pituitary changes according to the breed employed; in some there was no effect, in others adenoma was produced. D. T. B.

Amenorrhœa: its causation and treatment. R. T. FRANK, M. A. GOLDENBERGER, U. J. SALMON, and G. FELSHIN (J. Amer. Med. Assoc., 1937, 109, 1863-1869).-A clinical study of 27 amenorrhœic patients is reported. Examination of the blood and the urinary excretion for cestrogens in 21 cases showed that cases with almost complete ovarian afunction, sub-threshold function, normal follicular activity, or excessive activity were represented. In these 4 groups gonadotropic assay on blood and urine showed either over- or under-function. No evidence of either a primary pituitary or a primary ovarian causation of amenorrhœa could be demonstrated. The threshold of response to æstrogenic therapy in amenorrhæic patients is much higher than at the menopause. Disappearance of gonadotropic substance from the urine produced by 30,000 rat units of cestrogenic substance warrants the diagnosis of the menopause and may be used to differentiate from amenorrhœa. Estrogenic and gonadotropic preps. were ineffective in the treatment of amenorrhœa. R. L. N.

Treatment of menorrhagia and metrorrhagia by endocrine products. J. C. BURCH, G. S. MCCLELLAN, J. W. SIMPSON, C. D. JOHNSON, and E. T. ELLISON (J. Amer. Med. Assoc., 1937, 109, 1869– 1871).—A discussion on the clinical application of gonadotropic substances, progesterone, and thyroid preps. in the treatment of menorrhagia and metrorrhagia. R. L. N.

Endocrines in relation to sterility and abortion. J. C. LITZENBERG (J. Amer. Med. Assoc., 1937, 109, 1871—1873).—A review of the causes and treatment of sterility suggests that little benefit has been derived from endocrine treatment except for thyroid extracts. Sterility was frequently associated with low basal metabolic rate. Thyroid medication was useful in the treatment of functional menstrual disturbances, increasing the percentage of conceptions. R. L. N.

Endocrine treatment of vaginitis of children and of women after the menopause. R. M. LEWIS and E. L. ADLER (J. Amer. Med. Assoc., 1937, 109, 1873—1875).—Treatment of 82 cases of gonorrhœal vaginitis in children by vaginal suppositories of æstrogenic substances gave better results than hypodermic or oral treatment. Similar results obtained by other workers are reviewed. Typical senile vaginitis responded well to similar treatment. R. L. N.

Endocrine treatment of menopausal phenomena. J. P. PRATT and W. L. THOMAS (J. Amer. Med. Assoc., 1937, 109, 1875—1877).—A study of 100 cases showing menopausal symptoms demonstrates the difficulty in distinguishing pathological from physiological states. Symptomatic improvement was obtained from æstrogenic therapy, but equally good results were obtained by various other agents used empirically. Substitution therapy should be reserved for those cases in which pathological symptoms can be demonstrated to be due to ovarian failure.

R. L. N.

"Habitual abortion," its incidence and treatment with progesterone or vitamin-E. P. M. F. BISHOP (Guy's Hosp. Rep., 1937, 87, 362—371).— Habitual abortion is defined as "idiopathic abortion" occurring on more than one occasion before the 28th week of pregnancy. 2687 consecutive cases from the ante-natal clinic showed incidence of habitual abortion in 0.41%. Records of 22 cases treated with progesterone or vitamin-E show 10 successes, 5 improvements, and 7 failures. Of the failures, 2 were considered due to inadequate dosage, 3 were atypical cases, and the remainder were unexplained. In 3 cases successfully treated a subsequent pregnancy proceeded normally to term without treatment.

W. R. S.

Effects in female young born of pregnant rats injected with androgens. J. B. HAMILTON and W. U. GARDNER (Proc. Soc. Exp. Biol. Med., 1937, 37, 570—572).—Daily injection of testosterone propionate into female rats during the last third of pregnancy caused the female young to show male superficial characters, particularly an absence of vaginal opening and of nipples, whilst the internal organs were practically normal. V. J. W.

Postponement of appearance of æstrus following interruption of pregnancy in lactating mice. K. TAKEWAKI (Proc. Imp. Acad. Tokyo, 1937, 13, 371—373).—Lactation was induced in 9 pregnant mice by suckling. Following hysterectomy the advent of æstrus was delayed as compared with nonlactating pregnant controls. W. F. F.

Suppression of cestrus in the rat during pregnancy and lactation. T. McKEOWN and S. ZUCKERMAN (Proc. Roy. Soc., 1938, B, 124, 464-475).—After destruction, by electro-cautery, of corpora lutea of both ovaries of rats during the 3rd to 7th days of pseudo-pregnancy cestrus reappeared within 4 days. Control pseudo-pregnancy in 5 unoperated animals lasted 12 to 15 days. When corpora lutea of 3 pregnant rats were destroyed, and foctuses and placentæ removed in first half (6th, 6th, and 7th days) of pregnancy, œstrus recurred in 4, 7, and 3 days, respectively. Destruction of corpora lutea only in 2 pregnant animals on 4th and 5th days of gestation led to reappearance of œstrus in 4 days. Removal of foctuses and placentæ only at 6th and 7th days of pregnancy led to reappearance of cestrus in 5 to 8 days. Thus, in the first half of gestation, even if the placentæ secrete progestin, it is not enough to suppress œstrus. Destruction of corpora lutea between 11th and 16th days (second half) of pregnancy did not lead to re-appearance of cestrus; in only 1 of 12 animals so treated was pregnancy normal; 2 aborted, and in 9 there was partial resorption of uterine contents. Thus the placentæ produce much less progestin than the corpora lutea, since they cannot usually sustain more than one foetus in the absence of corpora lutea. The progestin threshold which can inhibit cestrus in pregnancy is much lower than the threshold needed

to maintain the fœtuses, since œstrus does not recur after destruction of corpora lutea so long as normal placental tissue survives. When corpora lutea were destroyed in lactating animals, œstrus did not occur if suckling was allowed to continue, but occurred within 5 days if suckling was stopped. It is suggested that the factor concerned with lactation which inhibits œstrus is hormonal. F. B. P.

Recent pregnancy tests and their relation to the treatment of pernicious anæmia. G. AURI-SICCHIO (Dtsch. med. Woch., 1938, 64, 118—120).— The pregnancy tests of De Nito (diminution of leucocytes in rabbits following intravenous injection of 5—10 c.c. of pregnancy urine), and of Kapeller-Adler and Pouliot (change of size of pupil when a few drops of pregnancy serum are introduced into the conjunctival sac) are non-sp. "Positive" reactions were observed in non-pregnant women and in men treated with liver preps. The histidine content of these preps. is held responsible for the "positive" reactions. A. S.

Effect of sex hormones on lactation in the rat. S. J. FOLLEY and S. K. KON (Proc. Roy. Soc., 1938, B, 124, 476-492).- Œstradiol monobenzoate administered to intact lactating rats inhibits lactation markedly; it has much less effect on rats ovariectomised the day after parturition. Testosterone propionate but not progesterone or androsterone inhibits lactation. Lactation was normal in control rats ovariectomised the day after parturition, and then given daily injections of sesamé oil. Thus substances which can produce development of mammary ducts can inhibit established lactation. Progesterone cannot cause mammary growth unless given with cestrogenic hormone to animals previously sensitised by cestrogenic hormone. The feeble inhibition by cestrogenic hormone of lactation in rats ovariectomised the day after parturition suggests that progesterone can augment the inhibitory action of cestro-F. B. P. genic hormone.

Rôle of the cerebral cortex and of various sense organs in the excitation and execution of mating activity in the rabbit. C. M. BROOKS (Amer. J. Physiol., 1937, 120, 544—553).—Ovulation following coitus occurs normally in rabbits with sacral cords removed. After complete abdominal sympathectomy, hysterectomy, and extirpation of the proximal half of the vagina, coitus is accompanied by signs of emotional excitement and results in ovulation. Bilateral destruction of the labyrinths and auditory apparatus, enucleation of the eyes, and removal of the olfactory bulbs does not abolish sexual activity in either the male or female rabbit. It is concluded that ovulation results from intense sexual or emotional excitement rather than from a reflex initiated by stimulation of any sp. group of sensory endings.

M. W. G.

Pregnanetriols from pregnancy urine.—See A., II, 97.

Œstrogenic substances. J. SCHMIDT-THOMÉ (Ergebn. Physiol., 1937, 39, 192—251).—A review. W. McC. Bodily electrical potential changes associated with ovulation and early pregnancy in the chimpanzee. G. FINCH, R. M. YERKES, and J. H. ELDER (Proc. Soc. Exp. Biol. Med., 1937, 37, 560— 563).—P.d. between vagina and pubis were determined in a chimpanzee of known regular menstrual habits. A rise of e.m.f. took place on the 17th day of the cycle which was known from previous mating experiments to be the time of ovulation. On one occasion when pregnancy occurred there was a greater rise on the 21st day. V. J. W.

Determination of heat in the guinea-pig. W. C. YOUNG, E. W. DEMPSEY, C. W. HAGQUIST, and J. L. BOLING (J. Lab. clin. Med., 1937, 23, 300— 303).—The change in behaviour prior to and during heat, and the exact details of the method by which heat is detected, are described. T. H. H.

Thermoregulation among the viscera with description of a means of producing hypothermia in unanæsthetised animals. J. B. HAMILTON (J. Lab. clin. Med., 1937, 22, 1106— 1110).—The temp. of the rat uterus is unchanged during elevation of body temp. by yeast and dinitrophenol, lowering of body temp. by methyleneblue, cocaine, and anæsthesia, and severe hypoand hyper-thermia induced by environmental exposure. This thermal uniformity is independent of the amount of uterine blood flow and is probably due to direct tissue conduction. T. H. H.

Effect of urine of pregnancy on alcoholic fermentation and the prenatal diagnosis of sex. I, II. A. MOSSINI (Boll. Soc. ital. Biol. sperim., 1937, 12, 711—712, 712—713).—I. The action of the urine (1 c.c.) on fermentation (indicated by the rate of evolution of CO_2) by brewer's yeast did not show a high correlation with the sex of the (human) fœtus, although a tendency for the CO_2 evolution to be greater with cases of a female fœtus was evident.

II. A result similar to the above was obtained when the material extracted by org. solvents from 100 c.c. of urine was used. F. O. H.

Stages in normal life-cycle of rabbit's ova. A. Russo (Arch. Sci. biol., Napoli, 1937, 23, 367— 372).—A description of the microscopical appearances of mature and degenerating ova. As degeneration proceeds crystals of stearic acid become conspicuous.

R. S. CR. **Respiration of mammalian ova.** I. DRAGOIN, G. BENETATS, and R. OPREAN (Compt. rend. Soc. Biol., 1937, **126**, 1044—1046).—The O_2 consumption of the ova of the cow, with discus proligerus, is about the same as that of the heart of the 4-day chick embryo. D. T. B.

Centres of sex hormone production in embryo and adult. V. DANTCHAKOFF (Compt. rend. Soc. Biol., 1937, 126, 851—854).—The embryonic gonad of the genetically male guinea-pig contains glandular cells resembling Leydig's cells in the adult. From these are formed the hormone determining male sex. This is true for the female chick, but not the male chick or female guinea-pig. D. T. B.

Determination of glucose in the blood, amniotic fluid, and embryonic extract of chick embryos at various stages of development. M. MILLETTI (Boll. Soc. ital. Biol. sperim., 1937, 12, 673—674).— The blood-sugar tends to increase during embryonic development of the chick. Vals. of 0.083—0.17%were obtained but high individual variations occurred. During the first 17 days of incubation, the amniotic fluid-glucose increased, being 0.055% on the 12th and 0.115% on the 17th day. The glucose content of embryonic extracts also increased from a min. of 0.06% on the 9th to a max. of 0.13% on the 13th day; this increase is probably related to the growth of the muscle-tissue. F. O. H.

Enzymes in ontogenesis (Orthoptera). III. Activation of naturally occurring enzymes (tyrosinase). J. H. BODINE, T. H. ALLEN, and E. J. BOELL (Proc. Soc. Exp. Biol. Med., 1937, 37, 450-453).—Grasshopper eggs were ground up and centrifuged in normal saline. Of the resultant three layers the middle one contained an enzyme which was tested on tyramine hydrochloride. By itself no activity could be observed, but on the addition of one of many possible "activators" O_2 became taken up in measured quantity. The "activator" used was Na oleate, but the top layer after centrifuging was also effective. V. J. W.

Formation of thymonucleic acid by partial synthesis during the development of eggs. J. BRACHET (Arch. Biol., 1937, 48, 529—548).—The thymonucleic acid content of Arbacia eggs increases during the first 20—25 hr. of development from 0.2— 0.4 mg. to 7.8 mg. per g. dry wt. There is no change in mononucleotide content, but the pentose-nucleic acid content shows a decrease almost exactly equiv. to the increase in thymonucleic acid. Synthesis of thymo- from pentose-nucleic acid is probable. Similar results are obtained with eggs of other species.

M. A. B.

Action of lithium and its determination in the sea-urchin embryo. S. RANZI and M. FALKEN-HEIM (Naturwiss., 1938, 26, 44–45).—Blastulæ and embryos of *Sphærechinus granularis*, Ag, and *Paracentrotus lividus*, Brandt, which have been transferred from sea-water to sea-water containing 5% of isotonic aq. LiCl, examined by $r_{\rm H}$ indicators and oxidase tests, show differences from the normal in protoplasmic colloid reactions but not in enzymic reactions.

F. O. H.

Action of peptone on cells cultivated in vitro and studied by dark-ground illumination. M. MILLETTI (Boll. Soc. ital. Biol. sperim., 1937, 12, 674-676).—With chick embryonic myocardial cells in embryonic plasma-Ringer's solution, normal migration and mitosis, and the presence of granules with active Brownian movement in the cytoplasm, occur when 3% of peptone is present. These modifications become less apparent as the concn. of peptone decreases until at 0.35% the cells appear to be normal. High concns. (up to 12%) of peptone inhibit cellular migration. The appearance of certain small granules is considered due to pptn. of the plasma-colloids by the peptone. F. O. H.

Ovoverdin, carotenoid-protein pigment of egg of the lobster. K. G. STERN and K. SALOMON (J. Biol. Chem., 1938, 122, 461-475; cf. A., 1937, III,
457).—The prep. of ovoverdin is described. The protein component of ovoverdin has albuminoid characters and the carotenoid component is an ester of astacene with an as yet unknown fatty acid. Most probably 1 mol. of astacene ester is present per mol. Ovoverdin is pptd. by saturating its solutions with (NH₄)₂SO₄, Na₂SO₄, MgSO₄, and NH₄Cl, the pptd. ovoverdin redissolving in water. Freshly prepared Al(OH)₃ gel, but not Lloyd's reagent, fuller's earth, or kaolin, adsorbs ovoverdin from solutions containing $(NH_4)_2SO_4$. Water, 1% Na₂HPO₄, 20% glycerol, with and without dil. aq. NH₃, and ovalbumin are ineffective as elutrients. The green colour of solutions of ovoverdin buffered by PO₄'' or HCO₃' is practically unaltered by $Na_2S_2O_4$, whilst H_2 activated by colloidal Pd has no action. $30\% H_2O_2$ causes no immediate change, but during 1 hr. the colour changes to red, and the protein is pptd. The relationship between ovoverdin and visual purple is discussed. J. N. A.

(k) DIGESTIVE SYSTEM.

Modification of the Krasnogorski method for stimulating and measuring the secretion from the parotid glands in human beings. J. E. FINESINGER and G. L. FINESINGER (J. Lab. clin. Med., 1937, 23, 267—273).—The secretion of the parotid glands is transmitted to the measuring and recording apparatus by means of two Krasnogorski capsules held in place over Stenson's ducts by suction. The saliva displaces saline, each drop of which is recorded electrically. T. H. H.

Cat's submaxillary saliva obtained under nerve stimulation or adrenaline administration. G. O. LANGSTROTH, D. R. MCRAE, and G. W. STAVRAKY (Arch. int. Pharmacodyn., 1938, 58, 61— 77).—Chorda saliva differs from sympathetic saliva; the latter differs from adrenaline saliva. Chorda saliva is modified by adrenaline, which causes increased permeability and some sp. effects on secreting cells. D. T. B.

Neurosecretory control of the submaxillary gland. A. B. CHAUCHARD and P. CHAUCHARD (Arch. int. Pharmacodyn., 1937, 57, 241–283).—Submaxillary secretion is diminished by cold, atropine, nicotine, and decalcifying agents. The action is on the end organ. There is no antagonism between the two nerve supplies; adrenaline and acetylcholine act synergically on the gland. D. T. B.

Innervation of the cesophagus in mammals. G. OTTOVIANI (Z. Zellforsch., 1937, 27, 393-429). The intramural arrangement of the nerve fibres of the cesophagus was studied in man and small laboratory mammals with special reference to the neurosynaptic relations between vagal and sympathetic fibres. Ag impregnation techniques were used and controls were provided by vagotomy. In the branches of the vagus are found parasympathetic preganglionic, mixed, sensory, and very thin sympathetic fibres. The preganglionic fibres usually spread themselves out as a reticulum on the ganglion cells. The motor fibres end in characteristic nerve endings. The mixed fibres are mainly vagal in origin and reach ganglion cells or mix with intraganglionic fibres. The sensory fibres can be traced to nerve endings and sometimes join numerous fine fibres probably from the sympathetic. In the distal portion of the œsophagus the sympathetic contribution predominates and a different sort of motor nerve ending is seen on the smooth muscle. These are probably derived from the sympathetic. R. J. O'C.

Megaœsophagus and its neuropathology. E. ETZEL (Guy's Hosp. Rep., 1937, 87, 158—174).— The frequent association of megaœsophagus with corresponding enlargements of colon and ureter suggests some common origin. Degenerative changes in the ganglion cells of Auerbach's plexus are found in the whole of the author's series and are considered as precursors of the œsophageal condition. The plexus changes are part of a general disorder and are similar to those found in chronic deficiency of vitamin- B_1 . W. R. S.

Weights of stomach and intestine in slaughter animals. AssMANN (Z. Fleisch-Milchhyg., 1937, 47, 480–482).—In bullocks, the empty stomach accounts for 3-5%, the empty intestine $1\cdot7-2\cdot4$, stomach contenus $8\cdot6-16\cdot6$, and the intestinal contents $1\cdot7-5\cdot0\%$ of the live body-wt. In pigs the corresponding figures are: $0\cdot5-0\cdot7$, $2\cdot5-3\cdot2$, $0\cdot25 0\cdot45$, and $1\cdot26-1\cdot86$. Vals. for calves and sheep of different ages are also given. The alimentary tract and contents of large bullocks may account for 30%of the body-wt. W. L. D.

Digestion in the dog without spinal cord below the cervical region. H. HERMANN, G. MORIN, F. JOURDAN, and J. VIAL (Arch. int. Physiol., 1937, 45, 461-483).-Hunger, passage of food through the stomach, and intestinal function were observed for 14-418 days on 5 adult dogs whose spinal cords had been removed below the cervical region, and for 100 days in a dog which had undergone supra-diaphragmatic section of the vagi 90 days before the cord operation. In the first 5 dogs hunger and appetite remained, the passage of food (observed radiologically) accelerated, digestive secretions and the was absorption of food were little altered, and the animals soon recovered or exceeded their initial wts. There were no abnormalities in abdominal viscera. In the vagotomised dog, however, the appetite varied according to the degree of stasis of food in the atonic stomach. The wt. fell steadily and at autopsy the stomach showed an ulcer as well as dilatation.

C. E. B.

Motility of the gastrointestinal tract. R. P. WALLACE et al. (Amer. J. Roentgenol., 1938, **39**, 64— 66).—The passage of a Ba meal was studied by X-ray, in 52 ambulant ward patients with no signs of gastrointestinal disorder. 4 evacuated all the Ba within 24 hr., 21 within 48 hr., 34 within 72 hr., 42 within 96 hr., and all within 120 hr. After partial evacuation of the meal the position of the remaining column of Ba did not change until the next mass movement occurred. W. F. F.

Inhibition of human gastric hypermotility by atropine or novatropine. J. P. QUIGLEY (J. Pharm. Exp. Ther., 1937, 61, 130–133).—Records of stomach movements, activated by insulin, were obtained in man, by a balloon method. Atropine and novatropine both had inhibitory effects, similar in type and duration. The minimal doses which uniformly produced complete inhibition were 0.65 mg. of atropine, and 1.5 mg. of novatropine. E. M. S.

Effect of atropine on the gastric contents of man. S. L. IMMERMAN (J. Lab. clin. Med., 1937, 23, 256—261).—170 patients were examined for change in fasting contents of the stomach, and 105 for changes in the test meal, after $\frac{1}{75}$ grain of atropine given hypodermically had been allowed to act for $\frac{1}{2}$ and $1\frac{1}{2}$ hr., respectively. The vol. of the fasting contents was reduced 17.4 c.c., and the vol. of the test meal increased 41.5 c.c. The acidity was not materially affected except so far as changes in vol. concentrated or diluted the acid. T. H. H.

Insulin and gastric motility. J. LALICH, W. B. YOUMANS, and W. J. MEEK (Amer. J. Physiol., 1937, 120, 554—558).—The inhibition of gastric motility produced by insulin injection after vagotomy also occurs after cutting the splanchnics, removing one adrenal and the medullary portion of the other, and removing the coeliac ganglia. The action of insulin is believed to be peripheral. M. W. G.

Normal gastric secretion of infants and small children following stimulation with histamine. R. D. CUTTER (J. Pediat., 1938, 12, 1-15).-36 boys and 36 girls aged 4 days to 4 years were fasted for 8 hr. (4 hr. if under 10 days of age) and the fasting contents removed. 0.02 mg. per kg. body-wt. of histamine was injected subcutaneously and the gastric contents were removed over 40 min. The gastric secretory vol. and total and free acidity increased rapidly from birth to 1 year and then more slowly to 4 years; $p_{\rm H}$ determinations showed rapid decrease during the first year and thereafter a const. level to 4 years. The increase in vol. of secretion during the first 4 years was proportional to growth as measured by body-wt. In all results there is a high degree of dispersion indicating a wide normal range of vals.

C. J. C. B.

Interdependence of gastric secretion and carbon dioxide content of the blood and its significance in the alkali treatment of peptic ulcer. E. D. KLEFER (Amer. J. digest. Dis. Nutr., 1937, 4, 667—673).—The total acid secretion response to the Ewald meal, to histamine, and to the alcohol meal was examined at varying levels of CO_2 -combining power (produced by the use of alkalis). As the blood- CO_2 rose the acid secretion tended to diminish. In cases of alkalosis in peptic ulcer, a reduction of blood-Cl was always associated with a raised CO_2 content, but the total of blood-Cl and -bicarbonate was const. C. J. C. B.

Physiological control of gastric acidity. C. M. WILHELMJ, R. W. FINEGAN, and F. C. HILL (Amer. J. digest. Dis. Nutr., 1937, 4, 547—550).—Dogs were given a $0\cdot$ ln-HCl test meal with or without histamine or a 2% Liebig's extract test meal with 15 mg. of phenol-red per l. to estimate the vol. of secretions mixed with the meal. In 34 normal dogs with a Liebig meal the quantity of total fluid secretion entering the stomach increased progressively until the stomach emptied. The quantity of acid fluid was low at the beginning, rose rapidly until in the middle period

there was usually more acid than non-acid fluid in the gastric contents, and then flattened off just before gastric emptying, when there was an abrupt marked relative increase in the amount of non-acid fluid, and bile appeared. By test meals on whole stomach pouches separated from the duodenum or after the Mann-Williamson operation of surgical duodenal drainage, the marked increase in non-acid fluid was shown to be due to regurgitation from the duodenum. The isolated stomach could not reduce the acidity of a 0.1N-acid meal unless the amount of acid given was small. Intra-gastric acid inhibition was shown by a progressively slower rise of acid secretion towards the end of the experiment in the isolated stomach preps. When histamine was given, this mechanism did not function. When acid passed into the intestine, gastric acid inhibition also occurred. By determining the amount of duodenal secretion which entered the stomach after Polya and Billroth II operations, the decrease in gastric secretion was greater than could be accounted for by dilution and neutralisation alone. Animals were divided into two groups: (1) in which gastric acidity was greatly influenced by stimuli arising in the pars pylorica and removal of that portion lowered the acidity; (ii) in which it was under the control of vagal influences and a double thoracic vagotomy was necessary to lower the acidity. In dogs with whole stomach pouches, absorption of water was easily detected and varied in amount in different animals irrespective of the degree of dehydration present. Physiological control of gastric acidity thus depends on the concn. of acid secreted; regurgitation of duodenal secretions; inhibition of acid secretion by the presence of acid in the stomach and later in the intestine; intensity of stimuli arising in the pars pylorica; vagal and cephalic influences and the absorption of water from the gastric contents.

C. J. C. B.

Food habits of the patient with peptic ulcer. M. ELDER and E. S. EMERY, jun. (Amer. J. digest. Dis. Nutr., 1937, 4, 493-494).—There was no difference in quantity or degree of balance of the diets of 25 peptic ulcer patients and 25 normal controls.

C. J. C. B.

Gastric hunger mechanism. II. Inhibitory effect of glucose solutions. I. A. MANVILLE and W. R. MUNROE (Amer. J. digest. Dis. Nutr., 1937, 4, 561—573).—Dogs were used in which a fistula from the stomach was made by means of a piece of jejunum. At 5 min. intervals the gastric juice was removed and 50 c.c. of water or 10% glucose were introduced. Gastric secretion provoked by histamine, pilocarpine, or insulin as well as psychic secretion was inhibited by glucose, as was motor activity induced by pilocarpine or insulin. Hunger contractions were also inhibited. There was definite dissociation between the secretory and motor activity of the stomach. C. J. C. B.

Total gastrectomy in dogs. A. BAISSET, J. DUCUING, and L. C. SOULA (J. Physiol. Path. gén., 1937, 35, 90—113).—A new method of gastrectomy is described in which the œsophagus is attached to the side of the duodenum, leaving a cul-de-sac. The mortality is low and out of 13 dogs several have survived a period of years, and have finally died

from severe anæmia. Otherwise the operated dogs have remained healthy. [Good photographs and X-ray pictures.] C. A. A.

Diarrhœa of the pancreatic insufficiency. J. A. BARGEN, J. L. BOLLMAN, and E. J. KEPLER (Amer. J. digest. Dis. Nutr., 1938, 4, 728—732).—In 2 cases of steatorrhœa due to pancreatic insufficiency administration through a duodenal tube of whole pancreatic juice, obtained continuously from the living dog by an intubation method, relieved the condition, which relapsed on stopping treatment. The ppts. from the pancreatic juice after treatment with alcohol, picric acid, or trichloroacetic acid given in capsules were also effective. C. J. C. B.

Colloid formation in the islet tissue of the pancreas of Scorpaena porcus. W. BARGMANN (Z. Zellforsch., 1937, 27, 450—454).—In S. porcus the pancreatic islet tissue is separate from the digestive portion of the pancreas. In the development of the islet tissue two types of cell were recognised : clear cells at the periphery and dark cells around the blood vessels. In the cytoplasm of some cells are found large homogeneous droplets probably colloidal in nature. Evidence is given in support of their derivation from nuclei.

R. J. O'C.

Differentiation of pancreatic cells in vitro. I. FISCHER (Z. Zellforsch., 1937, 27, 640-666).-The presumptive pancreatic tissue of Amblystoma mexicanum was explanted into fowl plasma diluted to one third with sterile distilled water with or without the addition of embryonic extract. The tissue was taken from stages ranging from the gastrula to one where the pancreatic cells were differentiated. Determination of the pancreatic cells in the gastrula stage was shown by their development from the undifferentiated ectoderm. Zymogen granules and in some cases organised pancreatic tissue were formed. Undifferentiated cells developed without the addition of embryonic extract because of their content of yolk granules; differentiated cells on the other hand required the addition of nutritive substances in the form of embryonic extract. Differentiated cells took up vital dyes whilst undifferentiated did not. In pancreatic cells both determination and differentiation are irreversible. R. J. O'C.

Lipins in the mammalian pancreas. I. AR-CHETTI (Z. Zellforsch., 1937, 27, 500—527).—The lipin content of the pancreas of many species was investigated by the Liebermann–Burchard reaction, the Lorrain Smith reaction, and the use of polarised light. Lipin granules were present in the efferent ducts, the connective tissue, and in the cells of both the endocrine and exocrine portions of the gland, but not invariably. In the same animal the amount of lipin varied from section to section probably because of different functional states of the cells. The lipin is not essential for the formation of either the endocrine or exocrine pancreatic secretion. Studies with polarised light suggest that some of the lipin present is in the form of glycerides. R. J. O'C.

New cannula for recording movements of the gut. L. DONATELLI (Arch. int. Pharmacodyn.,

1938, 58, 27—46).—A cannula is described to record separately contractions of longitudinal and circular muscle, and changes of capacity and pressure of intestinal loops, and to introduce reagents at varying pressure into the lumen. D. T. B.

Anoxæmia used as a means of analysing the structure and functions of the nervous system of the bowel. W. C. ALVAREZ (Amer. J. digest. Dis. Nutr., 1937, 4, 550-561).-Rabbits were killed and the bowel was kept at 37° in oxygenated Locke's fluid. Peristaltic rushes ceased the moment the circulation stopped when the bowel was left connected by the mesentery. When the aorta or superior mesenteric artery was clamped or the bowel cut away from the mesentery, rushes continued to travel for as long as 37 min. and thus appeared to be dependent on a nervous synaptic mechanism which survived for that length of time, and was ended by nicotine but not by atropine, cocaine, strychnine, Pb, or botulinus toxin. The synapses between vagal and enteric neurones conduct for 10-27 min. after stoppage of the circulation. Apparently normal rushes were sometimes observed when the whole bowel was excised, showing that the directing mechanism was located in the gut itself. There appeared to be at least 4 conducting systems in the small bowel of the rabbit: (1) fine nerve fibrils which cause the to-and-fro swaying movements and are highly resistant to anoxæmia and nicotine; (2) short tracts up to 15 cm. which are resistant to moderate dosage of nicotine and survive anoxæmia for 100 min. They degenerate after section of the splanchnic nerves; (3) long pathways running the length of the bowel and through the mesentery which are immune to nicotine and to anoxæmia indicating that they are unbroken by synapses; (4) pathways broken by synapses, sensitive to nicotine and anoxæmia, which are concerned with the peristaltic rushes. After death an inhibitory factor gradually disappears and the bowel responds more to impulses arriving by the long unbroken nerve tracts. Segments of bowel kept cyanotic and pulseless for 4-12 hr. function normally 3 weeks later. Intestinal muscles continued to contract rhythmically after anoxæmia had put an end to the function of the nervous system. The rate of contraction was slowed as soon as the circulation failed, and after section of either the vagus or the splanchnic nerves, or of both sets together. The normal rate of rhythmic contraction is kept at a high level by the extrinsic nerves of the bowel, which persist until the cut nerves degenerate. C. J. C. B.

Effects of bile salts on intestinal muscle. E. CHABROL, A. LEMAIRE, and J. COTTET (Compt. rend. Soc. Biol., 1937, 126, 1132—1134).—Intravenous injection of bile salts in the dog causes paresis or paralysis of the gut, suppresses or reverses the action of adrenaline, and annuls that of acetylcholine and prostigmine. D. T. B.

Myenteric activity modifications induced by caffeine. R. H. CHENEY (Proc. Soc. Exp. Biol. Med., 1937, 37, 572—573).—The addition of 1% of caffeine to the Tyrode's solution used to perfuse excised segments of rabbit's intestine caused decrease in amplitude of the movements and an increase of tone. V. J. W.

Investigations of the functions of the small intestine in men by intestinal intubation. I. Technique of intestinal intubation in man. II. Determinations of diastase, invertase, erepsin, lipase, and lactase in the pure juice of the small intestine. III. Factors influencing secretion of juice by the small intestine. W. H. OWLES (Clin. Sci., 1937, 3, 1–10, 11–20, 21–36).— I. A detailed account of a method of intestinal intubation which allows complete isolation of a segment of small intestine in man. The val. and limitations of the method are discussed.

II. Of the enzymes found in the pure secretion of the small intestine diastase is insignificant in amount and may even not be a true secretion. Invertase, erepsin, and lipase are present in significant amounts and are true secretions. Lipase has also been found and is also a true secretion.

III. The influence of the following factors on the vol. and total enzyme output of small intestine juice was examined. Local mechanical stimuli and colic cause an increase in both. Saline, carbohydrate solutions, 0·1N- or 0·05N-HCl, bile salts, and mixed intestinal juice have no effect. Local irritants and hypertonic solutions increase the vol. only, but hypertonic MgSO₄ increases the total enzyme output in addition. Oral administration of water, glucose, eggs, milk, and Fe salts increases both vol. and enzyme output. Histamine produces a temporary fall followed by a rise in both. A. N. D.

Intubation studies of the human small intestine. VII. Factors concerned in absorption of glucose from the jejunum and ileum. W. O. ABBOTT, W. G. KARR, and T. G. MILLER (Amer. J. digest. Dis. Nutr., 1938, 4, 742-752).-In healthy adults, long rubber tubes with two lumina and a terminal balloon were passed and glucose solutions given by mouth and the intestinal contents aspirated at different times. The concn. of the glucose solution fell greatly to 5% or less by the time it reached the jejunum or ileum, irrespective of the vol. or concn. of the glucose solution ingested. As the stomach evacuated a conc. glucose meal, the duodenal and upper jejunal contents, although diluted, were hypertonic with regard to the body-fluids, but in the lower small intestine, isotonicity was maintained. If hypertonic solutions are placed in loops of small intestine isolated by balloons, the rise in vol. and fall in concn. is very rapid. By connecting the balloons to a kymograph it was found that the propulsive contractions of the small intestine increased with the concn. of glucose above 5.4% in the gut. X-Ray studies after ingestion of a Ba-50% glucose mixture showed no delay in commencement of gastric emptying or jejunal filling. The glucose meal at first advanced more rapidly than the simple Ba meal and became greatly diluted. Later there was some delay in final gastric emptying and slowing of advance to the colon after the influx of fluid to dilute the glucose had ceased. With solutions of glucose below 5% the rate of absorption in the jejunum and ileum increased with the concn. C. J. C. B.

Absorption of carotenoids from the human intestine. M. VAN EEKELEN and W. PANNEIRS (Nature, 1938, 141, 203—204).—Estimation of the excretion of carotene and xanthophyll in the fæces of a man showed that absorption is very slight, especially of the former. Dissolution of carotene in oil increases absorption. C. A. K.

Adrenal cortex and intestinal absorption. F. VERZAR (Amer. J. digest. Dis. Nutr., 1937, 4, 545–546).—A review. C. J. C. B.

Gastro-enteritis. I. Clinical aspects of in-fantile diarrhœa. II. Chemical changes in the blood in infantile diarrhœa and the effect of intravenous administration of fluid. III. Changes in water and chloride content of the tissues in infantile diarrhœa and other conditions. E. D. COOPER (Arch. Dis. Childh., 1937, 12, 339-348, 349-358, 359-368).-Artificial feeding was the most important ætiological factor in 300 cases of infantile diarrhœa. The serum-protein, non-protein-N, and Cl were sometimes raised in acute gastro-enteritis; in chronic diarrhœa the protein and Cl were low. Intravenous saline and glucose injections slightly lowered the non-protein-N in normal infants over 3 hr.; the serum-protein fluctuated, indicating to-andfro movements of fluid between plasma and depots. In acute gastro-enteritis similar results occurred but the plasma remained diluted for a longer period. In chronic diarrhœa the changes were variable. When Ca gluconate was added to the injected fluid, in 4 patients with acute and chronic diarrhœa, the serumprotein rose to above the pre-injection level in 1-2 hr. and showed only a slight fall thereafter. In 67 infants dead from various diseases, some of whom had had saline infusions before death, the Cl and water contents of portions of muscles, liver, heart, kidney, brain, and lung were determined. The Cl and water content of infants' tissues are greater than those of adults. No loss of Cl or water from the tissues in cases dead of infantile diarrhœa was found; marked fixation of Cl and water particularly in the muscles may occur where saline had been given in life probably because of renal insufficiency. There was no relationship between Cl and water content and duration of illness or terminal temp.; cases with severe malnutrition often showed high Cl and water content and greater fixation after C. J. C. B. saline.

Deficiency states associated with gastrointestinal disease. D. L. WILBUR and A. M. SNELL (Amer. J. digest. Dis. Nutr., 1938, 4, 720-728).—A review. C. J. C. B.

Distribution of vitamin-C in gastro-intestinal tract. G. VON LUDÁNY and L. ZSELYONKA (Biochem. Z., 1937, 294, 108—111).—In the dog, the max. concn. of vitamin-C measured by 2 : 6-dibromophenolindophenol titration occurred in the mucosa of the small intestine; the mucosa of the fundus contained more than that of the pylorus, whilst the muscular layer concn. decreased from small intestine, large intestine, to œsophagus. C. C. N. V.

Reaction to acetylcholine of digestive tube of molluscs. M. BEAUVALLET (Compt. rend. Soc. Biol., 1937, 126, 1128-1130).—The intestine of Aplysia is stimulated by acetylcholine; that of the cuttlefish is insensitive. The cosophagus of the latter responds to acetylcholine in high concn. D. T. B.

(I) LIVER AND BILE.

Manganese in the liver of the embryo. Z. GRUZEWSKA and G. ROUSSEL (Compt. rend. Soc. Biol., 1937, 126, 965–966).—Max. vals. (0.007-0.011%) for Mn in the liver of the calf embryo occur at the 6th month and at the end of gestation.

H. G. R.

Effect of thymectomy on hepatic glutathione of albino rats. R. TURPIN, J. SÉRANE, and J. VAL-LETTA (Compt. rend. Soc. Biol., 1938, **127**, 96—98).— A decrease in both the total and reduced glutathione was observed after thymectomy, the max. effect occurring in the former. The max. decrease was observed 31 days after the operation, the val. returning to normal after 56 days. H. G. R.

Action of the liver on thyroxine. A. CARTENÌ (Arch. Sci. biol., Napoli, 1937, 23, 420–428).—No evidence of breakdown could be found after incubating thyroxine with minced liver at 37°. R. S. CR.

Thiocyanate formation during the abnormal state of liver function. I. Experiments in normal rabbits, in rabbits with experimentally injured liver, and in rabbits with blocked reticuloendothelial system. II. Observations in cases of the application of various liver functionpromoting factors in normal rabbits and in rabbits with experimentally injured liver. N. FUJIWARA (Jap. J. Gastroenterol., 1937, 9, 199-222, 223-249).-No CNS' is present in normal rabbit's blood (by Schreiber's method) but it appears in proportion to the amount of acetonitrile given. In rabbits poisoned by P, chloroform, or carbon tetrachloride, formation of CNS' from acetonitrile is impaired in proportion to the liver damage. In rabbits treated with "auto-" or "hetero-hepatotoxin" CNS' formation is also decreased but not if the reticulo-endothelial system is blocked by China ink or Collargol. Similar results were found when the livers from the above groups of rabbits were extirpated and perfused with diluted blood to which acetonitrile was added. Intravenous injection of glucose or *l*-aspartic acid, oral glucose, intravenous thyroxine, oral thyroid extract, or intravenous lecithin increased formation of CNS' after administration of acetonitrile. Similar results were found in rabbits whose livers were previously damaged by P, lecithin being especially active. Perfusion experiments on livers from these animals also showed increased CNS' production compared with normal livers. C. J. C. B.

Influence of phosphorus on the amount of thiocyanate formed by the liver after acetonitrileloading. N.FUJIWARA (Jap. J. Gastroenterol., 1937, 9, 250—257).—When rabbits are given a small amount of P (0.5—0.3 c.c. per kg. body-wt.) the amount of CNS' formed after giving acetonitrile is generally increased compared with normal rabbits. Perfusion experiments with livers from such rabbits and normal controls gave similar respective results.

C. J. C. B.

Experimental hepatic insufficiency. (A) Blood ammonia and -amino-acids in toxic hepatitis in the rabbit. (B) Blood-ammonia and -aminoacids in toxic hepatitis in the ferret. F. MEERSSE-MAN and M. BERGER. (C) Significance of Maillard's ratio and the blood-ammonia and -aminoacids. F. MEERSSEMAN (Compt. rend. Soc. Biol., 1937, 126, 1024—1025, 1025—1026, 1026—1028).— (A) The val. for blood-NH₃ is normal, the increase in Maillard's ratio being due to an increase in bloodamino-acids.

(B) The increase in Maillard's ratio is due to an increase in both blood- NH_3 and -amino-acids, the ratio between these two vals. being unchanged.

(c) In carnivora, hepatic insufficiency is accompanied by an increase in both blood- NH_3 and -aminoacids, but by an increase of only the latter in herbivora. Maillard's ratio is of val. in both cases since determination of NH_3 . N by Ronchèse's method also includes amino-acid-N. H. G. R.

Behaviour of the liver in the metabolism of amino-acids. II. Excretion of amino-acids into the bile and urine in normal rabbits and in rabbits with an injured liver. III. Irrigation of rabbit's liver with irrigation fluid containing various kinds of amino-acids. I. KITAMURA (Jap. J. Gastroenterol., 1937, 9, 312-336, 337-347).-II. The average amino-acid concn. in the bile of normal rabbits was 2.4 mg.% and in the urine 10.2mg.%. After intravenous injection of 7 mg. per kg. body weight of glycine or glutamic acid, there was no increase in amino-acid in the bile and only a little after injection of 21 mg. per kg. In rabbits poisoned with chloroform, the amount of amino-acid excreted in the bile and the concn. in the urine were increased; its abs. amount and the ratio amino-acid-N/total N were greatly increased, the amount differing with the different amino-acids.

III. The isolated perfused liver of normal rabbits can break down various amino-acids and form urea. Liver poisoned with chloroform is less effective.

C. J. C. B.

Simple atrophy of the liver. Its relation to increased resistance. D. H. SPRUNT (Arch. Path., 1937, 24, 738—742).—11 cases of human simple atrophy of the liver resembled histologically MacNider's experimental atypical repair in the liver of the dog. It is suggested that, as in the dog, this type of liver cell possesses greater resistance to toxic agents. C. J. C. B.

Prothrombin deficiency and the bleeding tendency in liver injury (chloroform intoxication). H. P. SMITH, E. D. WARNER, and K. M. BRINKHOUS (J. Exp. Med., 1937, 66, 801—812).—Liver injury due to prolonged chloroform anæsthesia in dogs is associated with a bleeding tendency and increased coagulation time. The syndrome is accompanied by a marked fall in prothrombin and fibrinogen in the blood. Small doses of chloroform ingested for 60 days cause liver injury and bleeding tendency with decreased prothrombin level but normal fibrinogen. Increase of fibrinogen in distemper still occurs with liver injury but the prothrombin level does not alter.

A. C. F.

Exclusion of liver in rabbit. H. P. HIMSWORTH (J. Physiol., 1938, 91, 413—426).—Instantaneous and painless exclusion of liver from the circulation is produced in the intact, unanæsthetised rabbit. Two preliminary operations are required. Four days after the second operation the liver is cut out of the circulation by tightening ligatures (ends through skin) previously placed around liver vessels. J. A. C.

Liver function in carbon tetrachloride or phosphorus poisoning. E. AUBERTIN, A. LACOSTE, R. DE LACHAUD, and R. MARTINET (Compt. rend. Soc. Biol., 1938, **127**, 57—60).—Dogs slowly poisoned by CCl₄ or P showed no blood or urine changes indicating hepatic insufficiency even when the liver lesions were severe, because of compensatory overactivity of the undamaged tissue. D. T. B.

Use of intravenous glucose curves to test liver function. R. WILSON (Proc. Roy. Soc. Med., 1937, 31, 74).—The test (Ross technique) was applied to two children, aged 8 years, both showing enlargement of the liver; in one there was considerable jaundice. In the latter case impairment of liver function according to the test was gross, in the other definite. The curves were improved by intravenous injection of liver extract. W. J. G.

Fructose administration as liver-function test. H. STEINITZ (Acta med. scand., 1937, 93, 98—121).— Oral administration of 60 g. of fructose per os and subsequent determination of blood-fructose is recommended as a test of liver function and has been carried out on a series of 300 cases, comprising normal cases and cases of liver damage (e.g., cirrhosis). In normal cases the blood-fructose rises 6—10 mg.%, but pathologically it may rise more or less slowly to higher vals., and return slowly to normal. Fructose metabolism is most deranged in diabetics. Fructose was determined by the micro-method of van Creveld. [B.] C. A. A.

Sucrose in tests of liver function. Effects of liver extracts. K. STEINITZ (Acta med. scand., 1937, 93, 122—149).—Sucrose can be used instead of fructose in the tolerance test. Increase of R.Q. and blood-lactic acid occurred in 15 min. in 8 normal patients. In 23 with diseased livers this was often long delayed. In 6 of these patients, liver extract ("Campolon") seemed to benefit the response to sucrose. C. A. A.

Glycogen in the liver. II. Quantitative variation of glycogen during discontinuation and resumption of feeding. (i) Rats. (ii) Mice. III. Glycogen in livers of rats fed on sugar diets. T. KUBOSHIMA (Sei-i-Kwai Med. J., 1935, 54, 1026-1049, 1476-1486). CH. ABS. (p)

Deposition of glycogen in normal and in experimentally damaged livers after oral and intravenous administration of glucose. T. L. ALTHAUSEN and M. STOCKHOLM (Amer. J. digest. Dis. Nutr., 1938, 4, 752—758).—20% aq. glucose was administered to one group of rats by stomach tube and to another group intravenously; liverglycogen was determined 3 hr. later. In normal rats or rats with liver damage produced by P injections, oral or intravenous administration of equal amounts of glucose lead to approx. equal deposition of glycogen in the liver. In rats with extreme liver damage, very little glycogen was deposited by either method. By increasing the amount of glucose given intravenously above the maximal rate of intestinal absorption, the deposition of glycogen in normal rats was increased, but in rats with liver damage the increase in glycogen was insignificant. Liver-glycogen was higher in rats (normal or with liver damage) during the spring than in autumn or winter. Glucose by mouth in cases with hepatic damage is thus as effective as when given intravenously. C. J. C. B.

Effect of follicular hormone and vitamin-C and their simultaneous administration on glycogen content of the liver of guinea-pigs. V. S. HERMANN (Z. physiol. Chem., 1938, 251, 78—84).— On daily subcutaneous administration of follicular hormone the glycogen content of the guinea-pig liver rises. Subcutaneous administration of 50 mg. of ascorbic acid per day led also to a marked glycogen rise. Simultaneous administration of follicular hormone and ascorbic acid caused a fall in the liverglycogen. D. M. N.

Enrichment in glycogen and decrease in the lipins in the liver in the normal, fasting dog after small, repeated doses of insulin. P. CRISTOL, L. HÉDON, A. LOUBATIÈRES, and P. MONNIER (Compt. rend. Soc. Biol., 1938, 127, 33-35). H. G. R.

Condensation of trioses to hexoses in the liver. H. IMANAGA (Biochem. Z., 1937, 294, 342-347).--Dihydroxyacetone in Ringer's solution saturated with O_2 disappears almost completely in 3-5 hr. when sliced rat's liver is added, fermentable aldose being produced in approx. 80% yield. Of the dihydroxyacetone not converted into aldose, part is converted into glycogen and part probably oxidised. With a fixed amount of liver the rate of transformation of dihydroxyacetone is independent of its concn. When fatty liver is used, or when N₂ replaces O_2 , no transformation occurs. *dl*-Glyceraldehyde undergoes transformation at the same rate as dihydroxyacetone but of the 60-80% transformed, half is converted into aldose and half into unfermentable ketohexose. When N_2 replaces O_2 , appreciable amounts of glyceraldehyde undergo transformation and when hexose diphosphate is added the extent of transformation in N₂ is the same as that in O₂. Hexose diphosphate has no effect on the transformation of dihydroxyacetone in O_2 or N_2 and phloridzin has no effect on that of dihydroxyacetone or glyceraldehyde. Possibly dihydroxyacetone changes into d-glyceraldehyde before under-W. McC. going conversion into aldose.

Fat metabolism. II. Influence of various kinds of nutrition on the acetone-forming function. III. Acetone-forming function of the liver damaged by various methods. M. MIYA-ZAKI (J. Biochem. Japan, 1937, 26, 1—17, 19—36).— II. Acetone formation from butyric acid in defibrinated blood perfusing the isolated dog's liver is not affected by a high-fat diet or by fasting for 1—2 weeks but is diminished by fasting for 3 weeks. The acetone-forming function of the liver appears to be related to its glycogen content and, to some extent, to extrahepatic factors.

III. Formation of acetone in the liver is not affected by obstructive jaundice or diabetes mellitus whilst it is diminished by poisoning with P, phenyl-hydrazine, tolylenediamine, CCl_4 , or chloroform. No correlation could be observed between the rate of acetone formation and histological changes in the liver. F. O. H.

Presence in the bile of a substance promoting the liver function. Further findings in the enterohepatic circulation of the bile. N. MIZUTA and Y. IKEGAMI (Jap. J. Gastroenterol., 1937, 9, 258-262).-1-10 c.c. of bile from the common bile duct of normal rabbits or from the gall-bladder of normal cattle was injected intravenously into other rabbits and the excretion of phenolsulphonephthalein in these rabbits studied by means of cannulæ in the common bile ducts. A small amount of bile increased the phthalein excretion but larger amounts decreased Alcohol and ether-alcohol extracts of conc. bile it. increased excretion, but the residue after extraction decreased excretion of the dye. Injection of ether extract of bile increased liver-glycogen, whether alone or after injection of 25% glucose, as measured by Pflüger and Imamura's method. 30 min. after injection of ether extract into a rabbit, the liver was removed and perfused with fluid containing salicylic acid; there was an increased rate of disappearance of the acid, suggesting that the substance also increased the detoxicating power of the liver. C. J. C. B.

Relation of the hydrogen-ion concentration of bile to the formation of gallstones. R. E. Dol-KART, K. K. JONES, and C. F. G. BROWN (Amer. J. digest. Dis. Nutr., 1937, 4, 587-591).-Weighed human gallstones were wrapped in gauze and suspended in flasks in bile of different $p_{\rm H}$ from different sources, and shaken for 7 days at 39°. There was no statistically significant difference in the relative solvent action of acid and alkaline bile from the ox, dog, and man on human mixed cholesterol gallstones. Comparison of quant. chemical analyses of human, dog, ox, and guinea-pig bile showed distinct differences in the relative concn. of the fatty acid to the unsaponifiable fraction of the bile, which may account for varying solvent action of the bile of C. J. C. B. different animals.

Bile acids from the bile of fishes. Thymnus thymnus and Stereolepis ishinagi. T. SHIMADA (J. Biochem. Japan, 1937, 26, 181–185).—The acids consist almost entirely of cholic and taurocholic acids. Cholesterol is also present. F. O. H.

Occurrence of cholic and of conjugated and free chenodeoxycholic acid in the bile of the mullet. S. MIYAZI and T. KIMURA (J. Biochem. Japan, 1937, 26, 337–339).—The bile contains, in addition to taurochenodeoxycholic acid, small amounts of tauroand chenodeoxy-cholic acid. F. O. H.

Bile acids in the bile of the kangaroo and leopard. T. KIMURA (J. Biochem. Japan, 1937, 26, 327-331).—The principal acids are glyco-, glycochenodeoxy-, and glycodeoxy-cholic (kangaroo) and taurocholic (leopard) acid. F. O. H. Resorption of bile acids in experimental jaundice. B. JOSEPHSON and H. KAUNITZ (Z. ges. exp. Med., 1937, 102, 195—201).—After ligature of the common bile duct in dogs the thoracic duct lymph contains considerably more cholic acid than arterial or portal vein blood. This difference is increased after the introduction of a mixture of cholic acid and fat into the stomach. Obstruction of the common bile ducts leads to a communication between bile and lymph channels. A. S.

Occurrence of bile pigment hæmochromogens in nature ; formation from hæmatin and hæmoglobin. R. LEMBERG and R. A. WYNDHAM (J. Proc. Roy. Soc. New South Wales, 1937, 70, 343—356).— Its spectrum (after reduction), and the production of biliverdin with acetone–HCl, show that horse-liver catalase (Stern, A., 1936, 378) contains verdohæmochromogen, which occurs also in cytochrome c (separated by fractional pptn. with SO₂), and in pig's serum and erythrocytes. Autoxidation of hæmochromogens in presence of certain reducing agents yields verdohæmochromogen, which is regarded as an intermediate in bile pigment formation in the body. A. LI.

Determination of bile pigments adsorbed by precipitated serum-proteins. G. INGVARSSON (Biochem. Z., 1937, 294, 407—416).—The pigment which adheres to the ppt. obtained when pathological serum is treated with alcohol is determined (as bilirubin) by washing the ppt. successively with 50% aq. methyl alcohol and 90% aq. methyl alcohol + light petroleum, dissolving in dichloroacetic acid, and comparing the colour of the solution with that of a standard. W. McC.

Filterability of bilirubinin obstructive jaundice. R. L. GREGORY and M. ANDERSCH (J. Lab. clin. Med., 1937, 22, 1111—1114).—Neither the bilirubin of the serum nor that of the urine of patients with obstructive jaundice can be ultrafiltered or dialysed under the experimental conditions described.

Т. Н. Н.

Improved technique of biliary drainages. F. C. FORSBECK (J. Lab. clin. Med., 1937, 23, 310-312).—A modification of the usual duodenal drainage technique is described, which reduces the time necessary to obtain bile to an average of 39 min. T. H. H.

(m) KIDNEY AND URINE.

Physiology of the kidney. A. N. RICHARDS (Bull. N.Y. Acad. Med., 1938, 14, 5-20).

Calcium content of the kidney as related to parathyroid function. W. DONOHUE, C. SPIN-GARN, and A. M. PAPPENHEIMER (J. EXP. Med., 1937, 66, 697-704).—Kidney-Ca increases from 4-61 mg. per 100 g. wet tissue to 11.42 mg. when moderate doses of parathormone are injected. Larger doses give a greater increase. Unilateral nephrectomy leads to a marked rise in the Ca content of the remaining kidney but only when the parathyroids are intact. A. C. F.

Mechanism of the renal elimination of vitamin-C. C. P. LEBLOND (Compt. rend. Soc. Biol., 1938, 127, 208—210).—Ascorbic acid is filtered from the plasma by the glomeruli and is found at the pyramid level of the kidney on account of reabsorption.

H. G. R.

Influence of blood components during renal disturbance. I. On the amount of glutathione contained in various organs. II. On the oxidoreductive ability of various organs. W. NISHIHIRO (Jap. J. Gastroenterol., 1937, 9, 294-303, 304-311). -Serum from normal rabbits or after removal of the kidneys or with U nitrate or cantharidin nephritis, or from patients with nephritis, was conc. after removal of protein and extracted with alcohol and ether. The extracts were injected intravenously into normal rabbits, the animal was bled to death 1-5 hr. later, and the amount of reduced glutathione in the various tissues determined. The pathological sera only contained a substance, sol. in alcohol and ether but not found in the residue after extraction, which decreased the amount of reduced glutathione in different organs, most in the liver and least in the brain. The substance increased with the lapse of time after removal of the kidneys, and caused its max. effect 2-3 hr. after injection; it was heatresistant except in an alkaline medium, and markedly increased the indophenol-oxidase reaction and methylene-blue-reducing ability of the tissues.

C. J. C. B.

Metabolism of ketones in the kidneys. T. TERASHIMA (Jap. J. Gastroenterol., 1937, 9, 263–272).—The kidney of starved rabbits was removed and perfused with their own diluted defibrinated blood. The ketones present before and after perfusion in both fluid and urine were determined. In a control experiment little change occurred. When β -hydroxybutyric or acetoacetic acid was added to the perfusion fluid, the total ketones diminished by 31% and 39%, respectively. It was concluded that the kidneys are concerned with the metabolism of ketones.

C. J. C. B.

Does the rabbit kidney contain histidine decarboxylase? K. ZIPP and A. GEBAUER (Klin. Woch., 1937, 16, 754).—No histidine was found after incubation of Tyrode solution containing *l*-histidine with rabbit kidney for $2\frac{1}{2}$ hr. at 38° when tested on atropinised guinea-pig intestine and on the cat's blood pressure. F. W. L.

Deposition of amyloid in kidneys with restricted circulation. D. R. DRURY and E. M. BUTT (Proc. Soc. Exp. Biol. Med., 1937, 37, 453).—A loop of thread was placed around one renal artery of a young rabbit so that the renal circulation became restricted as the animal grew up. When the other kidney was removed the animals survived if the remaining kidney represented 30% of the total previous kidney mass. After some months this remaining kidney showed amyloid degeneration in the glomeruli and the intertubular capillaries. None was found in other organs or in the anamic kidney when the other kidney was not removed. V. J. W.

Behaviour of basic dyes injected into the urethra of the toad (*Bufo vulgaris*, L). L. LISON (Compt. rend. Soc. Biol., 1937, **126**, 255-257).—The apical pole of the cells of the ureter and Bowman's membrane are very permeable to the basic dyes. Coloration of the epithelial cells of the tubules disappears fairly rapidly after intraglomerular injection whether the circulation is interrupted or not.

H. G. R.

Does absorption occur in the urinary bladder? J. CONRADT (Arch. int. Physiol., 1937, 45, 325– 331).—An operation is described by which fluids can be placed in the healthy bladder of the male dog and withdrawn without contamination by urethral or ureteral fluids. Water and NaCl of physiological concn. were recovered unchanged in quantity or concn. Conc. aq. NaCl rapidly altered the vesical epithelium. Urea was slightly absorbed from solutions of normal physiological concn., the quantity of water remaining const. Mixtures of NaCl and urea behaved as solutions of the single substances.

C. E. B.

Influence of diet and fluid intake on glomerular excretion, as measured by the Rehberg number (ratio of urinary to blood creatinine). W. MORACZEWSKI, S. GRZYCKI, and W. GUOFA (Acta Biol. Exp., 1937, 11, 115—117).—Transient diuresis is observed after protein, and transient retention of water after fat or carbohydrate, meals. These effects appear, from determination of the Rehberg no., to depend on variations in glomerular filtration. In healthy subjects the Rehberg no. varies parallel with water secretion. R. T.

Urinary [nitrogen : "vacate" oxygen] ratios in fasting tortoises and hedgehogs. M. LÜDICKE (Biochem. Z., 1937, 294, 314—324).—In tortoises (*Testudo græca* and *T. herrmanni*), the ratio increases when the food-intake decreases and vice versa. During fasting, the ratio increases gradually until, in approx. 32 days, the val. is 2—3 and then decreases whilst the urine-Cl decreases. The ratio decreases slightly when the fasting tortoises are exposed to reduced temp. (7°) but increases on return to normal temp. In hedgehogs, the ratio decreases during fasting. Exposure to reduced temp. followed by restoration to normal temp. causes the ratio to increase. W. MCC.

Individual variations in the relation between urea clearance and creatinine clearance. J. BING and T. BJERING (Acta med. scand., 1937, 93, 318—329).—The ratio of urea clearance to creatinine clearance was found to be fairly const. (about 0.5) in both healthy and renal patients. In patients with

nephrosis studied over a period of 3 years, large variations were detected, the ratio being at one period const. at 0.25 (min.) and at others 0.75 (max.). No dietetic or other explanation could be found for these variations, which are attributed to changes in the tubules, since urea, unlike creatinine, is reabsorbed there. "Standard clearance" should be employed only when the urea concn. index is above 75.

C. A. A.

Effects of acids and alkalis on ammonia excretion. W. VON MORACZEWSKI and T. SADOWSKI (Arch. exp. Path. Pharm., 1937, **186**, 721–727).— Urinary NH_3 is increased by giving mineral acids or tartaric acid, but not lactic or acetic acid, and diminished by giving alkalis. Acids or alkalis do not affect the NH₃ level of the blood. The giving of chlorides or of excess of fluids leads to alkalosis, Cl-poor diet and restricted fluids to acidosis. H_3PO_4 and MH_4 phosphate cause a rise in blood- MH_3 . T. B. H.

Partition of urinary nitrogen of fasting and hibernating woodchucks (Arctomys monax). T. M. CARPENTER (J. Biol. Chem., 1938, 122, 343-347).-The % distribution of N in the urine of the woodchuck is unaffected either by prolonged fasting or by hibernation. P. G. M.

Determination of sulphuric acid in urine. C. RIEBELING (Z. physiol. Chem., 1938, 251, 41-42; cf. Klin. Woch., 1932, 11, 1757).— H_2SO_4 (concn. 0.05—0.8 g. per 100 c.c.) is rapidly determined in a graduated centrifuge tube by pptg. with 0.25 c.c. of aq. BaCl₂ of appropriate concn., centrifuging for a fixed period (usually 15 min.) at a fixed speed, and measuring the height of the deposit. The result is deduced from the height obtained when 0.01N-H₂SO₄ is treated in the same way. 0.25-1.0 c.c. of urine is used and the error is approx. 10%. W. McC.

Diastase in urine after experimental infection and intoxication. W. GRUNKE and H. I. LOTZE (Z. ges. exp. Med., 1937, 102, 88-93).-Diastase in urine was increased by subcutaneous injection of 0.05-0.005 c.c. of diphtheria toxin or 1.0-0.0001 c.c. of pneumococcal cultures in rabbits. A. S.

Renal function in obstructive jaundice. K. E. ELSOM (Arch. Int. Med., 1937, 60, 1028-1033).-16 patients with obstructive jaundice showed signs of renal damage consisting chiefly of excessive excretion of casts, epithelial cells, and leucocytes. Hæmaturia occurred in 6 cases, albuminuria in 4. Urea clearance was reduced in 8 cases. As jaundice subsided evidence of renal damage disappeared. Т. Н. Н.

Chemistry of the urine in jaundice. A. MÜLLER (Z. physiol. Chem., 1938, 251, 1-13).-In severe jaundice the bilirubin of the urine occurs chiefly in an active form which readily undergoes spontaneous oxidation (accelerated by p-dimethylaminobenz-aldehyde) in acid solution. This form, which restores the colour to leucomethylene-blue, is probably bound to a colloidal carrier and can be determined approx. in the non-dialysable fraction of the urine by the Congo-rubin method (Ostwald, A., 1919, ii, 400), Na salts of bile acids in 1-2% aq. solution being added to prevent pptn. of the dye. When the urine contains the active form of bilirubin, tyrosine and other hydroxyphenyl compounds cannot be detected with Millon's reagent. W. McC.

Density and chemical composition of urinary calculi. S. MIHAÉLOFF (Bull. Soc. Chim. biol., 1937, **19**, 1548—1558).—For cystine, oxalate, uric acid, and phosphate calculi, d averaged 1.631, 2.037, 1.741, and 1.771, respectively. A. L.

(n) OTHER ORGANS, TISSUES, AND BODY-FLUIDS. TUMOURS.

Bromine in living beings. Its cycle in nature. A. DAMIENS (Chem. Weekblad, 1938, 35, 23-28).-The mean Br content of various parts of the human Q (A., III.)

body is 0.167 mg. per 100 g. and the mean Br : Cl ratio 0.84×10^{-3} . The ratio varies in individual animals but is fairly const. in the different organs. The distribution of Br in a very large no. of foodstuffs, plants, medicinal herbs, and natural waters, as well as the elimination of Br after the administration of therapeutic doses of KBr or NaBr, are discussed. The wide distribution of Br is emphasised. S. C.

Essentialness of manganese for the normal development of bone. W. D. GALLUP and L. C. NORRIS (Science, 1938, 87, 18-19).-Mn is essential for normal bone growth in chicks. C. A. K.

Diffraction studies of the effect of sodium fluoride and parathormone on the incisors and tibiæ of rats. L. REYNOLDS, K. E. CORRIGAN, H. S. HAYDEN, I. G. MACY, and H. A. HUNSCHER (Amer. J. Rœntgenol., 1938, 39, 103-126).-X-Ray diffraction patterns of teeth and bone were studied in rats. The enamel and dentine are identical with natural apatite. Apatite structure in teeth is retained on a diet containing (1) fluoride, (2) Al sulphate, or (3) a combination of both; and in bone (1) on a diet containing 0.3% of NaF, (2) with normal diet and parathormone injections, (3) on fluoride diet with parathormone, and (4) in rachitic animals. The greatest irregularities of structure are found in animals fed on NaF. The brittleness of the fluoride teeth is due to lack of orientation, increased crystal size, and heterogeneity of material. Parathormone produces increased orientation with a normal crystal size. In the bones studied (tibiæ) practically no orientation was found in normal or in pathological cases, but the NaF diet tended to increase crystal size. Ashed bone powder patterns show little difference with different diets.

W. F. F.

Extra- and intra-cellular water in bone and cartilage. V. IOB and W. W. SWANSON (J. Biol. Chem., 1938, 122, 485-490).-Determination of the water, Na, and Cl contents of the bones and of the water, Na, and K contents of the cartilage of 18 human foctuses showed that the calc. val. for the distribution of extra- and intra-cellular water in fortal cartilage is approx. the same when Cl, K, or Mg is used as basis for the calculation. The Na content of bone increases very slightly during fœtal growth, the changes in extra- and intra-cellular water being determined almost entirely by the progressive decrease in the Cl content. W. McC.

Hypertrophic cartilage and bone marrow growth. C. HUGGINS and K. M. SMITH (J. Exp. Med., 1938, 67, 41-48).-Thorotrast injected intravenously is ingested and retained by macrophages in bone marrow. New growth of marrow can then be shown as a thorotrast-free area histologically or radiographically. Phagocytic cells accumulate in the neighbourhood of hypertrophic cartilage, the removal of which constitutes their main function. Increase of the marrow in length occurs at the metaphysis and in width at the periphery. Macrophage growth in the liver and spleen is interstitial. A. C. F.

Normal arsenic content of human hair. J. WÜHRER (Biochem. Z., 1937, 294, 401-406).-The As_2O_3 content of human hair is 5—50 µg. per 100 g. Much greater contents are found in the hair of persons poisoned with As. W. McC.

Carbohydrate content of skin proteins. V. Collagen. W. GRASSMANN, J. JANICKI, L. KLENK, and F. SCHNEIDER (Biochem. Z., 294, 1937, 95—100). —A modification of Zuckerkandl's method (A., 1931, 1081) for the determination of amino-sugars in presence of protein hydrolysates is described. No glucosamine is present in collagen. The proteins of the ox-skin contain the following carbohydrates : globulin fraction, $2\cdot2^{\circ}$, equiv. to 1:1 mannose/ galactose; albumin, $2\cdot2-2\cdot6\%$ of carbohydrate, equiv. to 1:1 mannose/galactose + $0\cdot64\%$ of aminosugars; mucoid, $7\cdot7\%$ of lactose + $1\cdot53\%$ of aminosugars; collagen, $0\cdot65\%$ of lactose. C. C. N. V.

Calcium-phosphorus ratio in the skin and blood of the rabbit during growth. J. ALQUIER and A. MICHAUX (Compt. rend., 1937, 205, 748—749; cf. A., 1937, III, 423).—The % Ca in the skin of black and white rabbits is higher than that of grey at birth; the difference increases with age. The % P diminishes with age in both groups. The Ca/P ratio of the skin of black and white rabbits varies from 0.11 to 0.51, that of grey from 0.11 to 0.35. The blood-Ca in both groups reaches a const. min. and -P a max. at one month; the min. Ca/P ratio in both groups is 0.15—0.18. In full-grown rabbits it is 0.22. J. L. D.

Crystallisation of ferritin. V. LAUFBERGER (Bull. Soc. Chim. biol., 1937, 19, 1575–1582).—A cryst. protein, *ferritin*, Fe 20.02, N 9.93, P 0.96%, is isolated from the spleen and the liver of the horse by pptn. of the aq. extract with $(NH_4)_2SO_4$ and purified by pptn. with CdSO₄ followed by dialysis.

Effect of cysteine on tissue cultures in vitro. J. M. P. SOARES (Compt. rend. Soc. Biol., 1938, **127**, 242—245).—The addition of cysteine to the culture retards fibrinolysis and augments cellular metabolism. H. G. R.

Effect on tissue cultures of intercellular hormones from injured cells. G. S. SPERTI, J. R. LOOFBOUROW, and M. M. LANE (Science, 1937, 86, 611).—Extracts of 6-day old chicken embryos, after exposure to ultra-violet radiation, increased the rate of growth of fragments of embryonic chicken heart.

C. A. K.

A. L.

Distribution and pathological changes in light-absorbing substances in the animal body. I—III. Spectrography of fresh tissue. H. NODA (Acta Sch. med. Univ. Kioto, 1937, 20, 283—366).— Cytochrome was determined spectrographically in tissues of various species. Removal of the spleen has no influence on the amount of liver-cytochrome. Obstruction of the common bile duct leads to an increase of cytochrome in the liver, the max. being attained at the height of jaundice. There is less cytochrome in tumour tissue than in normal organs. A. S.

Mutual relation of blood and milk constituents of cows yielding abnormal milk. M. SATO and V. MURATA (Proc. XIth World's Dairy Cong., Berlin, 1937, 2, 46—50).—The blood and milk of 10 normal cows and of 30 cows giving milk showing positive alcohol tests were analysed for sugar and inorg. constituents. The Ca and K of normal blood and milk were higher but Na and Cl were lower. Bloodsugar was lower for the normal group (60 mg.%) than for the abnormal group (80 mg.%). Abnormality of milk composition is accompanied by an increase in those constituents found in greater concn. in blood. W. L. D.

Transference of indican and bilirubin from blood into abnormal milk. M. SATO and K. MURATA (Proc. XIth World's Dairy Cong., Berlin, 1937, 2, 50—52).—The two compounds do not occur in normal milk from healthy cows, but in cases of digestive disturbances, indican occurs in milk. In cases of severe disturbance of liver function, bilirubin occurs in the milk. W. L. D.

Effect of citric acid content of milk on the formation of acetoin. J. RUMMENTS (Proc. XIth World's Dairy Cong., Berlin, 1937, 2, 107–111).— Citric acid is determined as pentabromoacetone by oxidation to acetonedicarboxylic acid and bromination at 5°. In cultures, the *S. paracitrovorus* group decomposes citric acid, acetoin being one of the products. Acetoin accumulates in cultures only at $p_{\rm H}$ below 5.0 (optimum 4.3). W. L. D.

Variation in the fat content of milk secreted at different periods of the day. J. CSUKAS (Proc. XIth World's Dairy Cong., Berlin, 1937, 1, 381— 386).—The average fat contents of morning, noon, and evening milks are in the proportion $1\cdot 0: 1\cdot 29: 1\cdot 39$, but the variation is wide for individual cows and for different seasons of the year. The min. and max. fat % of the milks of 8 cows taken over 30 days were $2\cdot 4$ and $5\cdot 5$. The fat % of morning and evening milk diverged as the period of lactation advanced until the latter contained 50% as much fat as the former. The yields for 3 times a day milking are 49, 27, 24% of the total daily yield. The % of total yield accounted for in the morning milking varied seasonally from 51 in early spring to 41-44 in early autumn. W. L. D.

Mineral contents of cow's and mare's milk. O. WELLMANN (Proc. XIth World's Dairy Cong., Berlin, 1937, 1, 460—467)—The detailed compositions of 51 samples from 12 cows are reported. The composition of the ash is given. The % of ash was 0.74-0.85, Ca 0.118-0.146, P 0.096-0.155, and Ca/P ratio 0.92-1.32. 36 samples of mare's milk were analysed (20 indoors, 16 on grass). The % ash range was 0.27-0.59, Ca 0.052-0.127, P 0.032-0.139, and Ca/P ratio 1.3-2.1. There was no significant difference in the composition on outdoor or indoor feeding. Mare's milk is more variable in composition than cow's. W. L. D.

Determination of ammonia in milk. F. MÜNCHBERG (Proc. XIth World's Dairy Cong., Berlin, 1937, 2, 544—546).—The determination of NH_3 in milk is of more val. for determining the breakdown of milk protein than determining increases in nonprotein-N. A direct determination is complicated owing to hydrolysis of urea and a base-exchange method using permutite gave satisfactory results. Added NH_3 was quantitatively recovered by this method. W. L. D.

Determination and characterisation of the component acids of butter fat. T. P. HILDITCH and H. E. LONGENECKER (J. Biol Chem., 1938, 122, 497—506).—The presence in butter fat of small amounts of Δ^{8} -decenoic, -do-, -tetra-, and -hexa-decenoic, octadecadienoic, and an arachidonic acid, and of larger amounts of oleic acid in the fat of cow's milk is demonstrated and the isolation from the fat of octoic, decoic, lauric, myristic, palmitic, and stearic acid is recorded. W. McC.

Quantity of theobromine in milk of cows fed a diet including this alkaloid. H. C. DOWDEN (Biochem. J., 1938, 32, 71-73).—After feeding 9 g. of theobromine daily to each of three cows for three weeks, the max. concn. of theobromine in the milks on the last day was approx. 7 mg. per litre.

J. N. A.

Lactoflavin of human milk. Effect of diet. R. MÜLLER (Klin. Woch., 1937, 16, 807—810).—The yellow fluorescence produced in human milk by a meal of 250 g. of ox liver is due to lactoflavin.

F. W. L.

Formation, isolation, and properties of milk sugars. C. H. WHITNAH and W. J. CAULFIELD (Kansas Agric. Exp. Sta. Ann. Rept. [1932-4], 1934, 83-85).-Methods of isolation and purification of common and rare sugars are described. A sugar resembling glucose occurred in whey (40 p.p.m.). Rats receiving a ration containing 20% of sucrose formed less cerebroside than when lactose was substituted for sucrose. Brains of rats receiving the sucrose diet equalled in wt. and total solids those of rats receiving lactose but contained only $\frac{1}{10}$ as much unsaturated cerebroside. The ability of lactose-fed rats to maintain normal growth depended on an impurity in the lactose. Growth with pure lactose was not greater than with sucrose but the galactoside content of the brain was greater. Correlation is shown between ability to learn and the unsaturated cerebroside and unsaturated phosphatides of the brain. CH. ABS. (p)

Mechanism of milk clotting. II. Rôle of hydrogen-ion concentration. I. N. KUGELMASS (Amer. J. digest. Dis. Nutr., 1937, 4, 523-525).— The course of clotting was followed with varying $p_{\rm H}$ of the milk. Milk clotted spontaneously at various $p_{\rm H}$ zones, insol. casein salts being formed between $p_{\rm H}$ 2.0 and 3.0, isoelectric casein at $p_{\rm H}$ 4.7, and Ca caseinate at $p_{\rm H}$ 6.5. Optimal rennet coagulation was at $p_{\rm H}$ 6.0. At $p_{\rm H}$ 5.3 acid pptn. commenced and rennet activity practically ceased. The rate of clotting with pepsin diminished as the mixture became more acid until $p_{\rm H}$ 2.7, when it increased again. C. J. C. B.

Utilisation of fractions of the nitrogen partition of blood by the active mammary gland. W. R. GRAHAM, jun., V. E. PETERSON, O. B. HOUCHIN, and C. W. TURNER (J. Biol. Chem., 1938, **122**, 275— 283).—The mammary gland of the goat utilises globulin, amino-acids, and a part of the non-protein-N of the arterial blood. N may be stored in the gland for use in the production of milk, and part of it is returned to the venous blood as albumin.

P. G. M.

Glucose infusion through the external pudic artery. W. E. PETERSEN and W. L. BOYD (Proc. Soc. Exp. Biol. Med., 1937, 37, 537—539).—Isotonic glucose solutions were infused for periods up to 6 hr. into the right external pudic artery of the cow. The lactose content of the milk from the right and left sides of the udder was the same. V. J. W.

Occurrence of octopine, agmatine, and arginine in the octopod *Eledones moschata*. D. ACKER-MANN and M. MOHR (Z. physiol. Chem., 1937, 250, 249—252).—Extracts of the tissues of *E. moschata*, after removal of arginine, yielded octopine. Agmatine was also isolated. D. M. N.

Origin of the calcium in the tegumentary skeleton of decapod crustaceans. P. DRACH (Compt. rend., 1937, 205, 1441—1443).—Maïa squinado, Herbst, Cancer pagurus, L., and Carcinides mænas, L., obtain little of the Ca in their skeletons from their diet but partly from deposits of $Ca_3(PO_4)_2$ in the liver and pancreas and mainly from sea-water. Calcification after "moulting" is arrested if Ca supplies are withheld. J. L. D.

Presence of histamine-like substances in the tissues of marine invertebrates. G. UNGAR, A. UNGAR, and J. L. PARROT (Compt. rend. Soc. Biol., 1937, **126**, 1156—1158).—The histamine contents of various tissues of marine invertebrates are tabulated. H. G. R.

Responses of the barnacle to some strong electrolytes and to urea, glucose, and glycerol. W. H. COLE and J. B. ALLISON (Physiol. Zoöl., 1937, 10, 405—411).—In a colony of barnacles the no. % showing const. rhythmic movements of the cirri is taken as an index of stimulation by various substances. An order of effectiveness of K and Na salts and of the non-electrolytes is given. Adaptation is found, and recovery from adaptation occurs with all substances tried except K. It is suggested that there are two groups of receptors: (1) closure receptors and (2) opening receptors. The observed actions of binary mixtures support this view. Osmotic pressure is not the only factor constantly associated with cirri movements. W. F. F.

Functions of the tube in sabellid worms. H. M. Fox (Nature, 1938, 141, 163).—Sabellid worms, removed from the tubes in which they normally live, die unless kept in aërated sea-water, and cease all movements. This latter effect is attributed to lack of afferent stimulation which the tube normally provides. C. A. K.

3:4-Dihydroxyphenylacetic acid in Cetonia aurata, L., and Potosia cuprea, F., and in Melolontha hippocastani, F. H. SCHMALFUSS [with A. HEIDER, J. KLÖVEKORN, G. BUSSMANN, R. GOEDECKE, and H. KRABERGER] (Biochem. Z., 1937, 294, 112—119).—The acid has been isolated from the scales of these animals. In the first two named it occurs in both free and combined forms.

C. C. N. V.

Fatty substances of Japanese wild bees and their combs. S. UENO and S. KOMORI (J. Soc. Chem. Ind. Japan, 1937, 40, 432B).—The bees investigated were Vespa mandarina, Smith, V. crabroniformus, Smith, and Polistes yokohamæ, Radoszkowski. The fatty matter was extracted and the unsaponifiable matter and mixed fatty acids were examined. The oil from the combs of each species was similar. The fatty acids of the comb oil of V. mandarina are chiefly palmitic, oleic, and linoleic acids; in the unsaponifiable matter oleyl alcohol and hydrocarbons were identified. No alkaloids were detected. The oil from the pupa of this bee differs from other insect oils. W. J. B.

Composition of the red pigments in the skin of the mite, *Trombidium*. C. MANUNTA (Boll. Soc. ital. Biol. sperim., 1937, **12**, 699—700).—The pigments include α -carotene and a red non-carotenoid pigment with absorption bands at 490 m μ . and higher. F. O. H.

Subcutaneous pigments of various races of Bombyx mori. C. MANUNTA (Boll. Soc. ital. Biol. sperim., 1937, 12, 698—699; cf. A., 1937, III, 252). —Various races of silkworm are characterised by pigmentation with carotenoids (carotene and xanthophyll), flavones, and a melanin-like pigment.

F. O. H.

Growth of silk-glands in the mulberry silkworm (Bombyx mori). G. M. GHIDINI (Boll. Soc. ital. Biol. sperim., 1937, 12, 701—702).—During the spinning period, the posterior and medial parts of the gland experience a dehydrating, and the anterior part a hydrating, process. The phenomenon is probably related to the occurrence of different proportions of sericin and fibroin in different parts of the gland (Manunta, A., 1937, III, 252). F. O. H.

Homogeneous heavy substances from healthy tissues. R. W. GLASER and R. W. G. WYCKOFF (Proc. Soc. Exp. Biol. Med., 1937, 37, 503—504).— Silkworms were frozen, ground up, and extracted with saline. The filtered extract was centrifuged and ultracentrifuged, and finally a yellowish opalescent solution was prepared which gave a sharp ultracentrifuge boundary. The substance forming this solution was less stable than most virus proteins, which it mainly resembles. V. J. W.

Histophysiology of the fatty and ectodermic tissue of the silkworm during ecdysis. A. PAILLOT (Compt. rend., 1937, 205, 1095—1096).— During ecdysis in the silkworm the albuminoid plasts in the cells of the fatty tissue may arise from migration of the nucleolus as well as from the chondriome. Glycogen for chitin formation is derived from epidermal cells. A. L.

Structure of silk-fibroin. M. BERGMANN and C. NIEMANN (J. Biol. Chem., 1938, **122**, 577— 596; cf. A., 1937, III, 168, 416).—Fibroin yields glycine 43·8, alanine 26·4, tyrosine 13·2, and arginine 0·95% on acid hydrolysis. These vals. together with those for the lysine and histidine contents indicate that the mol. probably contains $2^5 \times 3^4$ (or a multiple thereof) NH₂-acid residues and has a min. mol. wt. of 217,700. The constitution of the fibroin mol. resembles that of ox fibrin and globin and ovalbumin. Fibroin, after dissolution in ammoniacal Cu(OH), and pptn. with acid, is hydrolysed by papain activated with HCN, 60% of the peptide linkings being broken and more than 75% of the tyrosine, approx. 50% of the glycine, and more than 25% of the alanine being liberated. Glycine is determined by pptn. (to the extent of 88%) as the K Cr trioxalato complex (A., 1935, 737) with subsequent determination of the NH₂-N content of the ppt., the error when alanine and tyrosine are present being not greater than $\pm 1\%$. Alanine is determined, after removal of glycine, by fractional pptn. with Na dioxpyridate (dioxalatodipyridinochromiate), a special procedure being employed in interpreting the result. The relationships defining the general structure of the proteins so far investigated are probably applicable to all simple homogeneous proteins. W. McC.

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Sericin. I, II. T. ITO and K. KOMORI (Bull. Agric. Chem. Soc. Japan, 1937, 13, 1195—1207).— I. 20—25% of the cocoon layer of *Bombyx mori* consists of sericin, which can be extracted by hot H_2O . During the extraction, NH_3 is liberated, the amount of which is increased with increase of temp. and time of heating.

II. Using 0.02m-acetate buffer, there is max. pptn. of sericin-B from aq. solution at $p_{\rm H}$ 3.6—3.8. Sericin-A and -B contain 17.37% and 16.88% of N respectively. -B is difficultly sol. at the isoelectric point, whilst -A is easily sol. J. N. A.

Lipins and reducing substances in Leptinotarsa decemlineata, Say. R. G. BUSNEL (Compt. rend., 1937, 205, 1177—1179).—The % of total fatty acids and unsaponifiable matter decrease from egg to larva (third stage), increase again, and finally decrease as a result of metamorphosis. Just prior to hibernation, fatty acid increases greatly, falls to a low level in spring, and increases again when the animal begins to feed. In old age fatty acids are low. The sugar content of the larva increases until metamorphosis commences, and then falls. The changes in sugar content during the life cycle resemble those of the fatty acids. J. L. D.

Variations in secretory activity of human sweat glands. Y. KUNO (Lancet, 1938, 234, 299—303).—In human skin there are active and inactive sweat glands, the latter not responding even to high temp. or pilocarpine. The active glands can undergo great variations in their activity; their distribution is described and their total no. estimated at 2.0 to 3.5 millions. C. A. K.

Lachrymal elimination of glucose in alimentary hyperglycæmia. D. MICHAIL and N. ZOLOG (Compt. rend. Soc. Biol., 1937, **126**, 1042— 1043).—The lachrymal gland is more permeable to glucose than the kidney. Adrenaline causes lachrymal secretion of glucose through the hyperglycæmia produced and also by direct action on the gland. H. G. R.

Hippuric acid in ascitic fluid. K. SOAD and T. HEIMA (J. Biochem. Japan, 1937, 26, 281-284).-- Ascitic fluid (60.81 l.) from three cases of cirrhosis or cancer of the liver without kidney disease contained hippuric acid (33.4 mg. isolated).

F. O. H.

Glutathione in tissues of normal and tumourbearing animals. B. GOLDSCHTEIN and M. I. KOLOMIETZ (Ukrain. Biochem. J., 1937, 10, 497-521).—The amount of glutathione in kidney, liver, and spleen of rats and in healthy peripheral tissue of Jensen rat sarcoma has been determined. A slow oxidation of glutathione is shown by living tissue of Jensen sarcoma and spleen when aërated; the total glutathione content of these tissues decreases very slowly, differing in this respect from liver tissue. Practically no decrease in glutathione in tumour tissue occurs after 18 hr. aëration. Oxidation and destruction of glutathione in liver of sarcoma rats took place more quickly than in normal rats. The season has an effect on concn. and state of glutathione in normal tissues, glutathione being more easily oxidised in winter than in summer. J. N. A.

Ascorbic acid in tissues of normal and tumourbearing animals. B. GOLDSCHTEIN and D. VOL-KENZON (Ukrain. Biochem. J., 1937, 10, 551-558) .-The amounts of ascorbic acid in the dried tissues of the rat are in the descending order healthy peripheral tissue of Jensen's sarcoma, spleen, liver, kidney. The amount of ascorbic acid in the spleen of sarcoma-bearing rats is greater than that of normal animals. With aëration of normal liver, decrease in the amount of reduced ascorbic acid begins after 3-4 hr., whilst oxidation in the kidney takes place more quickly. In the spleen, decrease in the reduced form occurs only after 18 hr. aëration. In healthy tissue of Jensen rat sarcoma, decrease in ascorbic acid is rapid after 2-3 hr. aëration, but soon ceases. Oxidation of ascorbic acid in liver of sarcoma-bearing rats begins earlier and is more rapid than in liver of normal rats. The season influences the concn. and state of ascorbic acid in normal and sarcomatous tissue, the amount in winter being much greater than that in summer. A mechanism probably exists in the animal to keep glutathione and ascorbic acid in the reduced states and protect them from oxidation, whilst glutathione helps to stabilise reduced ascorbic acid. J. N. A.

Importance of calcium for the potassium exchange of the tumour cell. A. LASNITZKI (Brit. J. Exp. Path., 1937, 18, 423–425).—Determinations of K in Jensen rat sarcoma suspended in Ringer solutions, with and without Ca, indicate that Ca inhibits the diffusion of K from the tumour cell into the medium. R. L. N.

o-Aminoazotoluene as a carcinogenic agent. L. L. WATERS (Yale J. Biol. Med., 1937, 10, 179– 183).—22 out of 36 rats receiving 1 mg. of o-aminoazotoluene per g. of food died of lung abscesses; the high incidence of intercurrent infection is attributed to the toxicity of the assimilated dye. The dye was carcinogenic (confirmatory of Yoshida). 9 animals developed gross liver tumours and 6 others microscopic tumours. Of 14 animals autopsied after the 340th day on the diet, 13 had signs of tumour. All experimental animals autopsied from the 29th day on, showed areas of focal necrosis in the liver accompanied by regeneration of liver cells. A. G. W.

Innocuity of methylcholanthrene in the anterior chamber of the eye. J. A. THOMAS (Compt. rend. Soc. Biol., 1937, **126**, 1176—1178).—Methylcholanthrene inserted subcutaneously causes sarcoma in 50% of rats; in the anterior chamber of the eye it is innocuous for 1 year. D. T. B.

Production of tumours by benzene extract of liver from a cancerous subject. L. M. SCHABAD (Compt. rend. Soc. Biol., 1937, **126**, 1180—1184).— Tumours were produced in mice by injecting benzene extracts of liver from subjects with cancer elsewhere. D. T. B.

Hormone content of ovarian tumours. E. H. LEFFER, C. L. G. PRATT, F. B. PRATT, and D. M. VAUX (Lancet, 1938, 234, 249—252).—Prolan A was found in larger amounts in the cyst fluid of malignant than of innocent ovarian tumours. Prolan B was found in the cyst fluid of 2 out of 3 pregnant patients. (Estrin occurred only in follicular cysts, in concns. at least as high as in the normal follicle. C. A. K.

Effect of the papilloma virus (Shope) on the tar warts of rabbits. J. G. KIDD and P. ROUS (Proc. Soc. Exp. Biol. Med., 1937, 37, 518—520).— Portions of the warts produced by tar on the ear of the rabbit were removed. Some were steeped for some min. in Tyrode's solution and others in the same solution with virus added. They were then implanted in the leg muscles and subcutaneously in the same rabbits. The tissue without virus was absorbed and disappeared; that with the virus gave rise in a few cases to papillomatous growths which in 3 instances showed a carcinoid character. V. J. W.

Multiple myeloma. E. S. MILLS and J. E. PRITCHARD (Arch. Int. Med., 1937, 60, 1069—1083).— From a study of 4 patients with multiple myeloma of the plasma cell type it is evident that changes in the plasma proteins or Bence-Jones proteinuria are not always found, and when present bear no definite relation to degenerative changes in the kidney.

T. H. H.

20-tert.-Butylcholanthrene. 1'-Methyl- and 1': 10-dimethyl-1: 2-benzanthracene.—See A., II, 91.

(o) NUTRITION AND VITAMINS.

Historical studies of English diet and nutrition. J. C. DRUMMOND (J. Soc. Arts, 1938, 86, 191-206, 214-225, 246-258).—Lectures.

Applied food chemistry in dietetics.—See B., 1938, 221.

Value of milk in human nutrition. ERTEL (Proc. XIth World's Dairy Cong., Berlin, 1937, 3, 204—208). W. L. D.

Milk from the aspect of nutritive physiology. FLÖSSNER (Proc. XIth World's Dairy Cong., Berlin, 1937, 3, 208–212).—A discussion. W. L. D.

Effect of heat-treatment on the nutritive value of milk. S. K. KON and K. M. HENRY (Proc. XIth World's Dairy Cong., Berlin, 1937, 3, 223-227).-- The availability of Ca and P for growing rats, biological val. and true digestibility of protein are not affected by pasteurisation of milk by the holder method. If both raw and pasteurised milk are supplemented with Fe, Cu, and Mn both milks can serve in equal degrees as exclusive diets for rats. Carotene and vitamin-A are not affected by heat. -B, probably $-B_1$, suffers some loss and -C decreases by 20% on heat-treatment. W. L. D.

Milk powder in the nutrition of infants. M. MANICATIDE (Proc. XIth World's Dairy Cong., Berlin, 1937, 3, 230—231).—A dried milk of modified composition (15—21% of fat) is recommended as a cheap source for (Rumanian) infants. W. L. D.

Importance of milk in human nutrition. G. VON WENDT (Proc. XIth World's Dairy Cong., Berlin, 1937, 3, 263—264). W. L. D.

Preventive and beneficial action of milk and milk products on malnutrition caused by feeding excess of sucrose. R. SASAKI and M. KANDATSU (J. Agric. Chem. Soc. Japan, 1938, 14, 7—18; cf. A., 1936, 628).—Raw milk has an activity about $\frac{1}{3}$ to $\frac{1}{4}$ that of dried yeast, but the activity is almost entirely destroyed by heating at 96—98° for 30 min. Acid clay powder adsorbs practically all the active substance at $p_{\rm H}$ 3.0 from milk deproteinised with dil. H₂SO₄. Sweetened condensed milk (containing about 55% of sucrose) and unsweetened milk-powder contain the active principle. J. N. A.

Nutrition and disease in Denmark. J. CHRIS-TIANSEN (Lancet, 1938, 234, 336—341).—Owing to the large export of dairy produce, more vitamin-free fat (margarine) and sugar are consumed in Denmark than in any other country. This is held responsible for signs of much malnutrition and a high infant mortality rate. In 1918, owing to the blockade, butter consumption increased markedly and was associated with a big fall in the frequency of xerophthalmia, measles, and whooping cough. Hindhede's interpretation of this result as due to a low-protein diet is criticised; the improvement should be attributed to an increase in the consumption of "protective " foods containing particularly vitamin-A and -D.

C. A. K.

Anæmia in preschool children. Incidence in South London. T. COLVER (Lancet, 1938, 234, 245—247).—Of 310 preschool children under 3 years old 10% showed a severe anæmia which responded to Fe therapy. The normal standards are discussed.

C. A. K.

Effect of various diets on the healing process in bone fracture. K. ARAI (Sei-i-Kwai Med. J., 1935, 54, 1436—1447, 1487—1530).—A Ca : P ratio of 1.5 in the diet produces optimum healing. Addition of cod-liver oil is beneficial but is much less important than the Ca : P ratio. CH. ABS. (p)

Ætiological factors involved in the malformation of bones in young chicks. L. F. PAYNE and J. S. HUGHES (Kansas Agric. Exp. Sta. Rept. [1932— 4], 1934, 116).—In chick mashes containing 0.75 and 1.5% P maize produced a greater proportion of slipped tendons than did oats, wheat, or barley. The fibre content of the ration did not affect slipped tendons. Oat hulls tended to inhibit leg weakness. High-P rations intensified the occurrence of slipped tendons irrespective of the kind of grain fed.

CH. ABS. (p)

Dental caries and paradental disturbances. III. Dietary history and its value in dental and medical practice. N. SIMMONDS (Amer. J. digest. Dis. Nutr., 1937, 4, 497—503).—Tables of questions to obtain the dietary history of the patient of any age with particular regard to possible deficiencies of dental importance are provided. C. J. C. B.

Effect of diet on coccidean infection of rats. E. R. BECKER and N. F. MOREHOUSE (J. Parasitol., 1936, 22, 60—67).—Dietary deficiency of vitamins, proteins, and salts did not lower resistance to infection by *Eimeria miyairii*. Diets of high yeast, high liver, low or high salt, or low H_2O content did not modify the course of infection. Deficiency of vitamin-*B* and -*C* diminished the no. of oocysts eliminated during immunisation. CH. ABS. (*p*)

Hoven, or bloat, in dairy cattle. A. C. Mc-CANDLISH (Proc. XIth World's Dairy Cong., Berlin, 1937, 1, 410-412).-Rapid gas development in the rumen under certain conditions may cause a condition of distension difficult to relieve. This condition occurs mostly on pasture on good quality soils during the period May-Oct., with June as the most dangerous month. Evening dew and frost and rapid grass growth, wild white clover in pasture, and red clover in aftermath are favourable factors. Heavy water drinking after eating clover also favours bloat. The cause of the retention is saponin, which prevents the collection of gas into large bubbles and from coming in contact with the walls of the rumen. Exercise, dosing, and control of pasturage are methods of W. L. D. prevention and alleviation.

Essential nature of cobalt in bovine nutrition. W. M. NEAL and C. F. AHMANN (J. Dairy Sci., 1937, 20, 741—753).—Cf. A., 1937, III, 472. The total Co in a cow weighing 450 kg. is 25—30 mg. The daily intake in normal food is 1—2 mg. Response to treatment was obtained by increasing the daily Co intake from 5 to 10 mg. It is probable that elements other than Co are involved in the ætiology of "salt sickness." W. L. D.

Calcium deficiency and intestinal stasis. E. C. ROBERTSON (J. Nutrition, 1938, 15, 67-71).-Intestinal dilatation and stasis occurred in young rats on a low-Ca diet. S. J. C.

Iodine deficiency in a stock diet. C. B. FREU-DENBERGER and F. W. CLAUSEN (J. Nutrition, 1938, 15, 1—9).—The thyroids of rats on a stock diet supplemented by cod-liver oil or KI were significantly smaller than those of rats on the unsupplemented diet. S. J. C.

Influence of sex on iron utilisation. M. S. ROSE and H. J. HUBBELL (J. Nutrition, 1938, 15, 91-102). —Female rats, depleted of hæmoglobin by a milk diet, stored on the average 12% more Fe than males receiving the same amount of Fe per g. body-wt.

S. J. C.

Mineral studies with dairy cattle. C. F. HOFFMAN (Proc. XIth World's Dairy Cong., Berlin, 1937, 1, 397—399).—Vitamin-D, P, Ca, and Mg studies are described. -D work was confined to the prevalence of rickets in calves and the -D requirement of calves, which averages 2 U.S.P. units per kg. body-wt. The P requirement increases with age and pregnant heifers require 10—12 g. daily. For lactation, 10 g. of P are required daily per 450 kg. body-wt. with an extra 1.54 g. per kg. of milk produced. Rock phosphate sometimes contains sufficient F to injure cattle requiring a high level of P. Bone meal is the best source. Calves require 5 g. of Ca daily, and lactating cows 10 g. per 450 kg. live wt. and 1.5—2.0 g. per kg. of milk. Mg is not antagonistic to Ca in foods. Cows require daily 30—45 mg. and calves 16—20 mg. W. L. D.

Iron and copper in a normal calf ration. C. E. KNOOP, W. E. KRAUSS, T. S. SUTTON, and R. G. WASHBURN (Ohio Agric. Exp. Sta. Bimo. Bull., 1937, 22, No. 188, 129—135).—Supplementary feeding of Fe 0.02 and Cu 0.003% to calves increased the no. of erythrocytes and hæmoglobin contents rather more effectively than did Fe 0.03 and Cu 0.002%. The Fe and Cu contents of livers were increased in all cases, that of testes being unaffected. Bone composition and serum-Ca and -P were unchanged by the supplements. Rations containing 0.0176% of Fe and 0.0013% of Cu (dry wt.) satisfied the requirements of calves. A. G. P.

Influence of mineral feed on stimulation of the blood-forming process in suckling pigs. V. A. ALIKAEV and E. N. VASILEVA (Probl. of Animal Husbandry, U.S.S.R., 1935, No. 8, 72—79).— Anæmia and other alimentary diseases of suckling pigs were corr. by the administration of 25 mg. of FeSO₄ daily. Substitution of 5 mg. of CuSO₄ for the Fe prevented the inception of anæmia but did not increase the no. of erythrocytes or the hæmoglobin. CH. ABS. (p)

Nutritional significance of parenteral administration of polysaccharides. T. TERASHIMA (Jap. J. Gastroenterol., 1937, 9, 273-285).-Rabbits were injected intravenously with 1 g. per kg. of glycogen or starch and the amount of the substance injected was determined in the blood by a modification of Jongh and Planelle's method. The glycogen was still increased after 12 hr. The rate of disappearance was not influenced by adrenaline or insulin, and was increased by ligation of the pancreatic duct or by fasting, and markedly retarded by partial extirpation of the pancreas. Sol. starch disappeared almost completely in $\frac{1}{2}$ hr. 8–9% of injected glycogen and 1-5% of the starch were excreted in the urine in 24 hr. The blood-sugar was little affected by either; the liver-glycogen was only slightly increased by glycogen, much more by starch. Glycogen should be valuable in diseases where glucose must be supplied over a long period and starch where the liver-glycogen needs augmentation, without much C. J. C. B. hyperglycæmia.

Relation of fat to utilisation of lactose in milk. E. J. SCHANTZ, C. A. ELVEHJEM, and E. B. HART (J. Biol. Chem., 1938, **122**, 381–390).—Rats, a pig, and a calf when fed a whole-milk diet mineralised with $CuSO_4$, $MnSO_4$, and $Fe_2(P_2O_7)_3$ utilised efficiently all of the lactose. When a mineralised skim-milk diet was used, galactose was detected in the urine after a few days. 3-4% of butter fat, lard, maize, coconut, and linseed oils, and palmitic and oleic acids when added to the mineralised skim-milk diet prevented this excretion of galactose, but glycerol, butyric, β -hydroxybutyric, hexoic, and lactic acids were without action. On the mineralised skim-milk diet the blood-sugar rose to approx. 2 g. per l., whilst on whole milk it seldom exceeded 1.4 g. The significance of the results is discussed. J. N. A.

Serum-lipins in malnutrition. E. B. MAN and E. F. GILDEA (J. Clin. Invest., 1936, 15, 203–214).— Serum-cholesterol varied with the state of nutrition and was subnormal in the majority of emaciated patients. Vals. increased when nutrition was improved. Concess. of lipin-P were proportional to those of cholesterol. Serum-fatty acids were below normal in most cases of emaciation. Hypocholesterolæmia was unrelated to various diseases but was usually accompanied by low vals. for protein and albumin. CH. ABS. (p)

Dietetic value of calavos [California avocados] in prevention or cure of anæmia. LER. S. WEATHERBY (Calif. Avocado Assoc. Year Book, 1935, 53—55).—The fruit contains an average of 0.0015%of Fe which is highly effective in hæmoglobin regeneration in anæmic rats. CH. ABS. (p)

Long-term experiment with rats on a human dietary. J. B. ORR, W. THOMPSON, and R. C. GARRY (J. Hyg., 1935, **35**, 476—497).—After $2\frac{1}{2}$ years on a human diet a large rat colony showed lower blood-hæmoglobin, slower growth rate, slightly impaired reproductivity, increased susceptibility to infection, and poorer clinical condition than did control rats receiving a supplement of milk and green food. CH. ABS. (p)

Nutritive value of "teff" in man. G. BOR-GATTI (Boll. Soc. ital. Biol. sperim., 1937, **12**, 677— 680).—The nutritive val. of bread made from the African cereal "teff" is low owing to the poor utilisation of the constituent proteins and to the difficulty of baking to give a palatable product.

F. O. H. **Amino-acid content and nutritive value of gluten.** M. L. PADOA (Annali Chim. Appl., 1937, 27, 544—554).—Gluten from Italian grain used for the production of farinaceous foods (containing approx. 25% of gluten) contains aspartic acid 9.6, leucine 8.6, phenylalanine 4.08, alanine 5.02, glycine 8.62, proline 8.05, glutamic acid 26.78, tyrosine 1.34, histidine 0.97, arginine 1.89, tryptophan 1.24, lysine 1.23, cystine 1.43, and valine 3.27%. The nutritive val. of farinaceous foods is compared with that of milk, meat, etc. F. O. H.

Regeneration of tissue-proteins with nitrogenous food incapable of maintenance. A. ROCHE, J. ROCHE, S. DROUINEAU, and P. PASSELAIGUE (Compt. rend. Soc. Biol., 1938, **127**, 69—72).—The N lost by rats on a protein-free diet can be replaced by feeding gelatin, though this is not followed by a gain in wt. of the animal. H. G. R. Addition of an amino-acid essential for growth to a protein deficient in several, and regeneration of tissue-protein. A. ROCHE, J. ROCHE, S. DROUI-NEAU, and P. PASSELAIGUE (Compt. rend. Soc. Biol., 1938, **127**, 72—75).—Cystine and tryptophan have a prejudicial effect on regeneration of tissue-protein when administered with gelatin. H. G. R.

Milk goats as experimental animals. O. C. CUNNINGHAM and L. H. ADDINGTON (Proc. XIth World's Dairy Cong., Berlin, 1937, 1, 376—381).— The use of the goat as a pilot animal for nutrition and breeding experiments is suggested. A range of experiments connected with lactation which could be profitably pursued with the goat are enumerated.

W. L. D.

Vitamin problems during infancy. E. GLANZ-MANN (Ergebn. Vitamin- Hormonforsch., 1938, 1, 1-67). A. S.

Vitamins and reproduction. H. GUGGISBERG (Ergebn. Vitamin- Hormonforsch., 1938, 1, 263–333). A. S.

Carotenes and vitamins. L. RETI (Semana méd., 1936, I, 275–282).—A review. CH. Abs. (p)

Influence of vitamin-A on development of calves. P. F. SOLDATENKOV (Probl. of Animal Husbandry, U.S.S.R., 1935, No. 8, 80–83).—Feeding carrots to calves accelerated recovery from respiratory diseases and increased resistance to infection.

Сн. Авз. (р)

Growth of Leghorn embryos as influenced by a ration deficient in vitamin-A. H. M. Scorr and J. S. HUGHES (Kansas Agric. Exp. Sta. Rept. [1932— 4], 1934, 88—89).—Vitamin-A deficiency in hen rations did not affect the rate of growth of embryos in a 28-day period, caused some decrease after 56 days, but later (84 and 112 days) no effect was apparent. CH. ABS. (p)

Relation between vitamin-A metabolism and susceptibility to bacterial toxins. C. C. TOR-RANCE (Amer. J. Hyg., 1936, 23, 74–79).—The amount of vitamin-A in livers of guinea-pigs which had died from the effects of bacterial toxins was unrelated to the period of survival after injection of such material. Injection of tetanus toxin did not increase the rate of utilisation of -A stored in the liver. Less -A occurred in livers of animals from which bacteria were recovered at autopsy than in livers of those from which no organisms were recovered. The -A content of guinea-pig livers was lowest at that period of the year when standardisation of bacterial toxins by means of these animals proves most difficult.

Сн. Abs. (*p*)

Fat-soluble vitamins in buffalo milk. F. BÍLEK (Proc. XIth World's Dairy Cong., Berlin, 1937, 3, 199—202).—Vitamin-A is present in the milk, fat, and meat of the buffalo in lower amounts than in the cow. Milk and fat contain less, but buffalo meat contains more, -D than in the cow. Carotene and -Ain cow's milk depend on individual and breed properties but low -A and -D in buffalo milk is a characteristic of the species. The conversion of carotene into -A in the buffalo liver is slower and the natural -A requirement of this species is less than for the cow. W. L. D.

Carotene content and vitamin-A activity of Holstein and Guernsey butter fat. K. IGUCHI, K. MITAMURA, and T. KAMIYA (Proc. XIth World's Dairy Cong., Berlin, 1937, 3, 217—219).—Butter from the milk of both breeds was churned under identical conditions and the carotene in the fat was determined colorimetrically. Winter and summer contents of carotene in Guernsey and Holstein butter fat were respectively 3.5, 4.2, and 1.2, 1.3 mg.%. Biological tests showed that the -A activity of Guernsey was greater than that of Holstein but the differences decreased with higher levels of feeding of the fat. W. L. D.

Quantitative indophenol-blue reaction in animal tissue. P. E. SIMOLA and L. NORO (Suomen Kem., 1937, 10, B, 33-34).—The indophenoloxidase content of brain (rat) and liver (rat, mouse) has been determined colorimetrically. The tissues of thyroxine-treated and vitamin-A-deficient animals showed increased oxidase content, but -D deficiency or inanition had no effect. M. H. M. A.

Distribution of vitamin-A and factor A. J. R. EDISBURY, R. A. MORTON, G. W. SIMPKINS, and J. A. LOVERN (Biochem. J., 1938, 32, 118-140).-The pyloric cæca of herrings may yield an oil richer in vitamin-A than cod-liver oil, whilst those of salmon yield a non-saponifiable fraction which contains 13% of -A and 1.3% of factor A_2 . Salmon liver contains 6% of each. The factor A_2 tends to replace -A in fish eyes, which contain only 3—7 p.p.m. of the latter. The 693 mµ. band in the colour test is due to factor A_2 which may be a polyene alcohol containing one more CH:CH group than -A. Owing to the very variable amounts of -A in different species of fish and in their different organs, the vitamin does not appear to be an essential factor, although it is associated with food assimilation. P. G. M.

Aneurin. R. GREWE (Ergebn. Physiol., 1937, 39, 252–293).—A review. W. McC.

Chemistry of vitamin-B₁ (thiamin). R. R. WILLIAMS (Ergebn. Vitamin- Hormonforsch., 1938, 1, 213-262). A. S.

Synthesis of thiochrome and of aneurin.—See A., II, 116.

Vagotonic action of vitamin- B_1 on the dog's heart. T. TISLOWITZ and I. PINES (Klin. Woch., 1937, **16**, 923—926).—1 hr. after the intravenous injection of 10 mg. of synthetic vitamin- B_1 into dogs (under chloralose and curare) bradycardia and marked respiratory arhythmia with periods of apnœa appeared, due to central vagus stimulation. Daily injections of 1—2 mg. for 2—5 days produced similar signs in non-narcotised dogs, which subsided rapidly on cessation of administration. During the - B_1 action, adrenaline produced typical paroxysmal tachycardia. The respiratory arhythmia is harmless and not due to cardiac weakness. F. W. L.

Cocarboxylase (vitamin-B₁ pyrophosphate) content of plants. H. TAUBER (Proc. Soc. Exp. Biol. Med., 1937, 37, 541-543).—A no. of plant tissues were extracted by boiling in a phosphate solution, $p_{\rm H}$ 6.239, and the cocarboxylase of the extracts was determined by the method of Lohmann and Schuster. Content of vitamin- B_1 was determined biologically and showed no correlation with the content of co-enzyme. V. J. W.

Effect of B_1 -avitaminosis on oxido-reduction processes in muscle after fatiguing work and training. M. F. MERESHINSKI (Ukrain. Biochem. J., 1937, 10, 243—265).—Training (in pigeons) accelerates oxido-reduction processes even after fatigue, whilst B_1 -avitaminosis retards them.

P. G. M.

Sensitisation of the isolated intestine of the rat and the circulatory apparatus of the cat to acetylcholine by vitamin- B_1 . R. AGID, M. BEAU-VALLET, and B. MINZ (Compt. rend. Soc. Biol., 1937, **126**, 982–984).—Vitamin- B_1 reinforces the action of acetylcholine on the arterial pressure of the cat and on the isolated rat's intestine in absence of eserine. H. G. R.

Simplification of vitamin tests. Half-weekly instead of daily doses in vitamin- B_1 tests on rats. H. LINDHOLM, P. LAURSEN, and B. G. E. MORGAN (Biochem. J., 1938, **32**, 308—313).—Results of the comparison of vitamin- B_1 preps. against the standard are the same whether daily or half-weekly doses are given. P. G. M.

Vitamin- B_2 -deficient diet for growing rats. L. RANDOIN, A. RAFFY, and J. AGUIRREZABALA (Compt. rend. Soc. Biol., 1937, **126**, 872—874).—The diet consisted of starch 68, casein 17, butter fat 9, cod-liver oil 1, Osborn and Mendel salt mixture 1. Growth on this diet is defective unless lactoflavin is added. D. T. B.

Response of rats to graded doses of flavin. H. LINDHOLM (Biochem. J., 1938, 32, 314—320).—A daily dose of 10 μ g. of flavin or the equiv. of 2 g. of liver prevented loss of wt. in rats which had become stationary on the basal diet. The effect of graded supplements of flavin in addition to 2 g. of liver per day was represented by y = 2.95 + $24.04 \log x$ (males); $y = 5.53 + 15.85 \log x$ (females) (y = increase of wt. in g. and x = daily dose of flavin in μ g.). The probable error was +24.2 or -19.5%for males, and +26.5 or -20.9% for females. Dermatitis developed in rats given only low doses of flavin. P. G. M.

Effect of carbohydrate on vitamin- B_2 deficiencies. A. F. MORGAN, B. B. COOK, and H. G. DAVISON (J. Nutrition, 1938, 15, 27-43).—In the rat intestine lactose encouraged the production of flavin and "vitamin- B_6 " but not "filtrate factor." Maize starch either contained or produced "filtrate factor" but not the other factors. Sucrose neither contained nor produced any of the factors.

S. J. C. Atrophy of sebaceous glands in avitaminosis. S. G. SMITH (J. Nutrition, 1938, 15, 45—55).— Atrophy of sebaceous glands in the rat's tail may be produced by lack of some component of the vitamin- B_2 complex. S. J. C. Vitamin- B_2 and synthetic riboflavin. O. A. BESSEY (J. Nutrition, 1938, 15, 11–15).—The Sherman-Bourquin method of assaying vitamin- B_2 assays riboflavin, the unit being equiv. to $2\cdot0-2\cdot5\mu g$. of riboflavin. S. J. C.

Distribution of riboflavin in tissues. E. V. CARLSSON and H. C. SHERMAN (J. Nutrition, 1938, 15, 57—65).—In the well fed rat the concn. of flavin in the liver was 10—20 times, kidney 10 times, heart 5 times, and brain and spleen 2—3 times that in muscle. The concn. rose with increased dietary supply. S. J. C.

Arrest of cataract by riboflavin. P. L. DAY, W. J. DARBY, and K. W. COSGROVE (J. Nutrition, 1938, 15, 83—90).—The progress of cataracts in rats on a diet deficient in flavin was usually arrested by repeated injections of flavin. S. J. C.

Nicotinic acid and vitamin- B_2 . W. J. DANN (Science, 1937, 86, 616-617).—Nicotinic acid prepared from liver extract prevents blacktongue in dogs, but does not influence chick dermatitis as has been claimed by other workers. C. A. K.

Cure of canine blacktongue with nicotinic acid. H. R. STREET and G. R. COWGILL (Proc. Soc. Exp. Biol. Med., 1937, 37, 547—548).—Two dogs with chronic blacktongue, from Goldberger's diet no. 123, were immediately cured by adding 50 mg. and 25 mg. of nicotinic acid to their daily diet. V. J. W.

Response of pellagrins to nicotinic acid. T. D. SPIES (Lancet, 1938, 234, 252-253).— Administration (mainly oral) of nicotinic acid to 15 cases of pellagra produced prompt remission of glossitis, stomatitis, ptyalism, vaginitis, urethritis, and proctitis, and increased porphyrinuria disappeared. C. A. K.

Case of pellagra successfully treated with a filtrate factor obtained from liver. S. YUDKIN, J. C. HAWKSLEY, and J. C. DRUMMOND (Lancet, 1938, 234, 253-255).—A case of pellagra, who had a gastro-enterostomy and took an eccentric diet, was successfully treated by oral administration of a filtrate factor obtained from pig's liver. C. A. K.

Ætiology of pellagra and the nutritive value of maize. ANON. (Lancet, 1938, 234, 282–283).—A review. C. A. K.

Relation of nicotinic acid to growth and dermatitis factors in rice polishings. C. A. COOK, M. F. CLARKE, and A. E. LIGHT (Proc. Soc. Exp. Biol. Med., 1937, 37, 514—518).—Nicotinic acid, in doses up to 1 mg. daily, failed to stimulate growth or to cure dermatitis in rats kept on a sucrose diet supplemented with aneurin chloride and riboflavin. V. J. W.

B-Vitamins, except B₁ and the flavins. C. A. ELVEHJEM (Ergebn. Vitamin- Hormonforsch., 1938, 1, 140-158). A. S.

Cozymase as water-soluble vitamin. H. VON EULER, M. MALMBERG, I. ROBEŽNIEKS, and F. SCHLENK (Naturwiss., 1938, 26, 45).—Rats on a basal diet containing yeast-macerate treated with fuller's earth, aneurin, and lactoflavin show little or no growth and ultimately die whilst addition of cozymase (active or alkali-inactivated) produces rapid growth. F. O. H.

Distribution of vitamin-C in the organism. A. GIROUD (Ergebn. Vitamin-Hormonforsch., 1938, 1, 68—113). A. S.

Histochemical study of distribution of vitamin-C. E. TONUTTI (Klin. Woch., 1937, 16, 861).— In resting adrenals vitamin-C can be demonstrated in the cortex but not in the medulla. This is reversed after stimulation. In the testis the generative elements are almost -C-free except after stimulation; similar results were found in the thyroid. Storage occurs only in the mesenchyme of endocrine organs, *i.e.*, in cells in the adrenal cortex, testicular interstitial cells, and decidual cells. F. W. L.

Realisation of the normal ascorbic acid content [of organs of the guinea-pig]. A. GIROUD, R. RATSIMAMANGA, and E. HARTMANN (Compt. rend. Soc. Biol., 1937, 126, 988—990).—With liberal and varied diets, the adrenals, liver, and kidney contain 133—137, 32—35, 13—16 mg. of ascorbic acid per 100 g. of fresh tissue, respectively. H. G. R.

Ascorbic acid in tissues of various fish. S. V. FOMIN, N. M. ROMANJUK, and M. A. CHVOINITZSKA (Ukrain. Biochem. J., 1937, 10, 365—378).—In the salmon 89.9—215.6 mg. % of ascorbic acid are found. Liver-ascorbic acid is least in the cod (26.7 mg. %), and the liver oil contains none. Cod and salmon roe contain 120—160 mg. %. The content of the various organs is less in winter than in summer, and follows the decreasing order brain, liver, kidney, muscle.

P. G. M.

Vitamin-C in blood and menstruation. W. NEUWEILER (Klin. Woch., 1937, 16, 926—927).—No typical changes were found. F. W. L.

Effect of ascorbic acid on formation of connective fibres. H. MAZOUÉ (Compt. rend. Soc. Biol., 1937, 126, 991—992).—Intraperitoneal granuloma in the scorbutic guinea-pig showed a deficiency of connective fibres. 1—3 days after ingestion of ascorbic acid abundance of fibres and collagen was observed. D. T. B.

Alleged antitoxic action of vitamin-C in diphtheria. S. S. ZILVA (Brit. J. Exp. Path., 1937, 18, 449–454).—The resistance of guinea-pigs to diphtheria toxin was unchanged whether the animals were on a scorbutic diet or received an adequate diet and large injections of vitamin-C. R. L. N.

Vitamin-C and experimental diphtheria and botulinus infection. H. WEBER (Compt. rend. Soc. Biol., 1937, 126, 1029—1031).—Vitamin-C has no effect on the course of these infections in the rabbit.

H. G. R.

Vitamin-C in heart failure. W. EVANS (Lancet, 1938, 234, 308–309).—9 patients with ædema (8 of cardiac origin) were given vitamin-C, which produced a diuresis greater than that following digitalis, but less than that produced by NH_4Cl , theobromine, and diuretin. C. A. K.

Vitamin-C and the enzymic dissolution of dead material in the body. E. TONUTTI and K. H. MATZNER (Klin. Woch., 1938, 17, 63-64).—Cells which contribute to the resorption of dead or foreign material (e.g., catgut, degenerated muscle) store vitamin-C as do the resorbing cells in pneumonic tissue (demonstrated in experimental pneumonia of guinea-pigs). -C deficiency during human pneumonia may be due to its absorption by the pneumonic tissue. B. K.

Effect of vitamins on the activity of proteolytic enzymes. E. MARTINSON, J. FETISSENKO, L. SOKO-LOVA, V. SOLIANIKOVA, and G. TROITZKI (Bull. Soc. Chim. biol., 1937, 19, 1521-1547).-The proteolytic activity of the liver removed from guinea-pigs previously fed on a diet deficient in vitamin-C, as measured by the rate of autolysis and that of the hydrolysis of gelatin by a glycerol extract, was greater than that with normal animals. Avitaminosis-C also caused an increase in the oxidised glutathione content of various organs. Addition of ascorbic acid to the autolysing liver and to the glycerol extract increased the proteolysis and the production of urea in the autolysate. Carotene inhibits the catheptic action of the glycerol extract. Both ascorbic acid and carotene inhibit the tryptic action of the pancreatic juice of dogs. A. L.

Ascorbic acid in leprosy. R. O. PRUDHOMME (Compt. rend. Soc. Biol., 1937, 126, 1004—1005).— The leproma in guinea-pigs contain a high proportion of ascorbic acid, variations being parallel with that of the spleen. H. G. R.

Respiratory metabolism in guinea-pigs in hypervitaminosis-C. K. E. BELFRAGE and N. BERGQVIST (Uppsala LäkFören. Förh., 1937, 42, 385—398).—Guinea-pigs receiving orally a daily dose of ascorbic acid 50 times the min. necessary for the prevention of scorbutic dental symptoms showed no difference in O_2 uptake and CO_2 output from control animals receiving the min. daily dose of 1.33 mg.

T. S. G. J.

Vitamin-C deficiency in pregnancy and lactation. G. GAEHTGENS and E. WERNER (Klin. Woch., 1937, 16, 843-844).—During pregnancy in primiparæ tolerance tests showed a deficiency of vitamin-C of about 62%, and in multiparæ, of about 70%. The deficiency did not increase during lactation. F. W. L.

Chronic dietary deficiency (partial avitaminosis-C). Reversible and irreversible processes. G. MOURIQUAND and H. TÊTE (Compt. rend., 1937, 205, 822—824).—Absence of vitamin-C from the diet leads within 25 days to deficiency symptoms which are completely abolished by -C. Prolonged deficiency leads to additional, "irreversible" symptoms which terminate in death even when -C is fed. Guinea-pigs on a very low -C intake grow normally but show muscular hæmorrhage and œdema which tend to clear up even without additional -C in 20—30 days. About the 60th day, changes in the bony structure occur which resemble those in chronic rheumatism and are "irreversible." J. L. D.

Oxidation velocity of natural and synthetic vitamin-C. W. KLODT and B. STIEB (Arch. exp. Path. Pharm., 1937, 188, 21-34).—Klodt's modification of Tillmans' method is used (Med. Klin., 1936, No. 13). Aq. solutions of ascorbic acid are inactivated more readily by boiling than lemon juice. Inactivation on keeping is decreased by NaCl and increased by metals. H. O. S.

Oxidation of ascorbic acid in presence of guinea-pig liver. E. STOTZ, C. J. HARRER, M. O. SCHULTZE, and C. G. KING (J. Biol. Chem., 1938, 122, 407-418) .- Guinea-pig liver pulp slowly oxidises added ascorbic acid. The rate of oxidation increases with rise of $p_{\rm H}$ from 6 to 7.3, and decreases with fall in O₂ tension. The pulp loses 80-85% of its activity when heated at 100° for 5 min. With washed tissue, oxidation is unaffected by pyridine-KCNS, Na diethyldithiocarbamate, and 8-hydroxyquinoline, whilst KCN, CO, and NaN₃ (at $p_{\rm H}$ 6.4) act as inhibitors. The indophenol-oxidase-cytochrome system is chiefly responsible for the oxidation. A rapid oxidation of ascorbic acid occurred when the oxidase and cytochrome were used together. There is no evidence of the presence of either a sp. oxidase or active tissue-Cu in relation to oxidation of ascorbic acid added to liver. Glutathione present in liver pulp is unable to protect added ascorbic acid from oxidation. The acid is not an essential intermediate in the reaction of glutatione with O2, either through the indophenoloxidase-cytochrome system or in presence of Cu.

J. N. A.

Reduction of dehydroascorbic acid by guineapig tissues. M. O. SCHULTZE, E. STOTZ, and C. G. KING (J. Biol. Chem., 1938, 122, 395-406).-Dehydroascorbic acid is rapidly reduced when added to suspensions of liver, muscle, small intestine, blood, and erythrocytes, but not at any appreciable rate by heated or unheated blood-serum. It is reduced rapidly by heat-coagulated liver, free from glutathione. Reduction is inhibited completely by treatment of the tissues with iodoacetate or arsenite. In presence of large amounts of ascorbic acid, dehydroascorbic acid is not reduced by tissues at an appreciable rate. It is concluded that glutathione and fixed ·SH compounds in tissues are responsible for reduction of added dehydroascorbic acid. There was no evidence for enzymic reduction. J. N. A.

Effect of light on the vitamin-C of milk. S. K. Kon and M. B. WATSON (Proc. XIth World's Dairy Cong., Berlin, 1937, 3, 220—223).—Exposure of milk to daylight in glass bottles causes -C to be reversibly oxidised at first to dehydroascorbic acid, which is further oxidised to an irreversible form. Visible light of short λ and ultra-violet light are responsible but yellow and red have no effect. Light has no effect in the absence of O₂. Synthetic ascorbic acid added to milk behaves similarly. The reversibly oxidised product is biologically active but other oxidation products are inactive. As secreted by the cow, milk contains only the reduced ascorbic acid.

W. L. D.

2:4-Dinitrophenylhydrazine derivative of dehydroascorbic acid and the determination of vitamin-C. J. H. ROE (Proc. Soc. Exp. Biol. Med., 1937, 37, 465-467).—This *derivative*, m.p. 257-259° (corr.), is believed to be an osazone with the hydrazine groups attached to C atoms 2 and 3. It is reduced to a colourless compound by warming with HCl and $SnCl_2$ and then hydrolysed by heating with these reagents in an autoclave at 15 lb. pressure. The released dehydroascorbic acid is converted into furfuraldehyde, which is determined colorimetrically. It is claimed that ascorbic acid added to urine can be recovered quantitatively. V. J. W.

Standardisation of 2:6-dichlorophenol-indophenol. M. H. MENAKER and N. B. GUERRANT (Ind. Eng. Chem. [Anal.], 1938, 10, 25—26).—The aq. dye (15 c.c. of a 0.035—0.070% solution) quantitatively liberates I from KI, which is directly titrated with 0.01N-Na₂S₂O₃ using starch indicator. The results obtained are comparable with those using ascorbic acid as standard, but are slightly lower than those with lemon-juice. F. N. W.

Standardisation of the dye used for the determination of vitamin-C. R. E. BUCK and W. S. RITCHIE (Ind. Eng. Chem. [Anal.], 1938, 10, 26).—A method identical with that of Menaker and Guerrant (preceding abstract). F. N. W.

Combined ascorbic acid in plant tissues. E. J. REEDMAN and E. W. MCHENRY (Biochem. J., 1938, 32, 85—93).—Potato tissue contains a proteinascorbic acid complex which is pptd. by trichloroacetic acid or HPO_3 and hydrolysed by 0.2-1.0%HCl, after which it can be titrated with 2 : 6-dichlorophenol-indophenol. The complex is equiv. to reduced ascorbic acid in antiscorbutic properties. P. G. M.

Ten years of research on sterols, hormones corresponding with vitamin-D. I. M. HEILBRON (Chim. et Ind., 1938, 39, 19–30).—A review.

Provitamin-D in plants. A. WINDAUS and F. BOCK (Z. physiol. Chem., 1937, 250, 258—261).—The sterol content of a no. of plant products was determined, and the % of provitamin-D in the sterol was estimated. The highest content of provitamin was found in cottonseed oil and in *Scopolia* root. In both cases it was shown that the provitamin was ergosterol, not 7-dehydrositosterol. D. M. N.

Vitamin-D from fish oils. T. F. ZUCKER, E. J. SIMONS, H. C. COLMAN, and B. DEMAREST (Naturwiss., 1938, 26, 11).—An antirachitic compound, isolated from cod-liver oil as its allophanate, m.p. 174—176°, is identical with the irradiation product of 7-dehydrocholesterol (cf. Windaus et al., A., 1936, 982). Biological assay of the compound on rats gave the antirachitic activity as 30×10^6 international units per g. W. O. K.

Relationship between vitamin-D intake and linear growth in infants. F. SLYKER, B. M. HAMIL, M. W. POOLE, T. B. COOLEY, and I. G. MACY (Proc. Soc. Exp. Biol. Med., 1937, 37, 499—502).— 414 infants were maintained for the first year of life on a const. diet to which known amounts of codliver oil or irradiated milk were added. The group receiving the largest vitamin-D dosage grew most, those having a smaller dosage grew less, and those with no added vitamin grew least of all.

V. J. W.

Photographing line tests in vitamin-D assays. M. W. TAYLOR, D. KLEIN, and W. C. RUSSELL (Ind. Eng. Chem. [Anal.], 1938, 10, 26-29).—The technique of pretreatment, staining, and photography of rat's bones for recording vitamin-D assays is described. F. N. W.

Chicks may require vitamin-E for normal growth. H. J. SLOAN, L. E. CARD, and F. B. ADAMSTONE (Illinois Agric. Exp. Sta. 47th Ann. Rept., 1935, 115—117).—Laying hens require vitamin-E for natural reproduction. Destruction of -E(with an ethereal solution of FeCl₃) in a normal ration for chicks produced sp. growth disturbances. Wheat-germ and egg-yolk oils did not correct the deficiency. CH. ABS. (p)

(p) METABOLISM, GENERAL AND SPECIAL.

Mechanism of oxidative processes in the animal organism. A. V. PALLADIN (Ukrain. Biochem. J., 1937, 10, 559—579).—A review. R. T.

Growth and development. XLII. Methane, hydrogen, and carbon dioxide production in the digestive tract of ruminants in relation to respiratory exchange. L. E. WASHBURN and S. BRODY (Missouri Agric. Exp. Sta. Res. Bull., 1937, No. 263, 39 pp.; cf. A., 1936, 629).-A method for direct analysis of expired air is described. The ratio CO₂/methane in rumen gases decreases in a characteristic manner with increasing time after feeding. Food energy lost by fermentation (determined by energy equiv. of CO, and methane) approximates to 25% of the maintenance requirement of the animal when receiving only a maintenance diet. The abs. losses also diminish with increasing time after feeding. Rumination causes no appreciable increase in the concn. of CO_2 or O_2 in rumen gases. The low $CO_2/$ methane ratio in the intestine is not wholly attributable to rapid diffusion of CO₂ into the blood. Low ratios occur in the rumen during fasting. High ratios are found in the large intestine of horses. The increase in concn. of N_2 and O_2 in the rumen after feeding cannot be explained by diffusion of the gases into the rumen from external sources. A. G. P.

Respiratory quotient and glycogen reserve. E. M. BRIDGE (Bull. Johns Hopk. Hosp., 1937, 61, 349—357).—In normal unanæsthetised rabbits the R.Q. obtained during absorptive equilibrium was proportional to liver-glycogen but not so clearly to muscle-glycogen content. It is suggested that in man the fasting R.Q. offers a method of approx. determining liver-glycogen. T. F. D.

Relation of respiratory quotient to surrounding temperature. C. KAYSER (Compt. rend. Soc. Biol., 1937, 126, 1219—1222).—The R.Q. shows that fat is chiefly used by the non-fasting rat and pigeon for maintenance of body-temp. in cold surroundings. When shivering occurs carbohydrate is also used.

D. T. B.

Basal (standard) metabolism of the Australian merino sheep. II. Factors affecting basal metabolism. A. W. PEIRCE (Counc. Sci. Ind. Res. Australia, Bull., 1934, No. 84, 7—22; cf. A., 1932, 420). —Seasonal variations in pasturage effected changes in the standard metabolism of sheep, average heat production in winter—spring, summer, and autumn being 1350, 1080, and 1040 kg.-cal. per sq. m. per day, respectively. Shearing caused no appreciable alteration in energy exchange. Heat production of sheep standing quietly was 8% greater than of those lying down. Ram and wether lambs and wethers showed slightly though not significantly higher heat vals. than did ewes of corresponding age. A. G. P.

Variability of basal metabolism: its application in conditions of health and disease. W. M. BOOTHBY, J. BERKSON, and W. A. PLUMMER (Ann. intern. Med., 1937, 11, 1014—1023).—A simple statistical treatment is given of basal metabolic records taken during a 10-year period at the Mayo clinic. It is emphasised that basal metabolism is a variable measure. C. A. K.

Basal metabolism of Oklahoma men and children. O. NALBANDOV, V. G. HELLER, E. KRAUSE, and D. I. PURDY (J. Nutrition, 1938, 15, 23-26).—The mean basal metabolic rate of 75 Oklahoma men was 5.63% lower than that calc. from Dubois' standards; that of young children corresponded with these standards, but with increasing age the rate gradually fell below them. S. J. C.

Basal heat production and endogenous nitrogen excretion. U. S. ASHWORTH and G. R. Cow-GILL (J. Nutrition, 1938, 15, 73—81).—The endogenous urinary N excretion of growing rats was not proportional to their basal metabolic rate; differences in body composition did not account for the lack of proportionality. S. J. C.

Heat production in man. IV. T. W. ADAMS and E. P. POULTON (Guy's Hosp. Rep., 1937, 87, 107—139).—Basal metabolism is defined as heat liberated in oxidative processes by the subject at rest in the post-absorptive state and calculations are based on the CO₂ production in this state. Up to 105 cm. height gives a better basis for measurement of basal metabolic rate than does wt. and, above this, wt. is the better index. Between 74 and 105 cm. the fat storage of infancy is used up with a corresponding break in the relation log CO₂/log height. Height gives a better basis than age for comparison of physiological development.

W. R. S.

Carotenoids in animal metabolism. L. ZECH-MEISTER (Ergebn. Physiol., 1937, 39, 117—191).—A review. W. McC.

Some problems of tyrosine metabolism. H. S. RAPER (J.C.S., 1938, 125–130).—A lecture.

Rôle of the acetyl derivative as an intermediary stage in the biological synthesis of amino- from keto-acids.—See A., II, 98.

Amino-acid catabolism. V. Effect of structural configuration on deamination of α -aminoacids in the dog. F. H. SNYDER and R. C. CORLEY (J. Biol. Chem., 1938, 122, 491—496; cf. A., 1937, III, 421).—Determination of the total, urea-, NH₃-, and amino-acid-N (and in some cases isolation from the urine of the amino-acid concerned) in the urine of dogs after oral or subcutaneous administration of NH₂-acid shows that *dl*-phenylalanine, *dl*leucine, l(+)-valine, l(+)-isoleucine, l(+)-alloisoleucine, and l(?)(+)-phenylglycine are readily deaminated in the organism but that *dl-\p*-leucine, *dl*- allothreonine, d(-)-isoleucine, d(-)-valine, and d(?)-(-)-phenylglycine are only slightly or not at all deaminated. It is concluded that α -amino-acids (not phenylglycine and allothreonine) having the *l*-configuration are deaminated readily in the body if the C atom carrying NH₂ and the β -C atom both carry also H and that α -amino-acids having the *d*-configuration and H on the α -C atom are readily deaminated if the β -C atom carries 2 H but not if one of these 2 H is replaced by Me or OH.

W. McC.

Fission of the amide linking in the animal body. K. BERNHARD (Z. physiol. Chem., 1938, 251, 47—51).—N-Substituted amides of hexahydrobenzoic acid and of benzoic acid are attacked in the body. When the following compounds were fed to dogs or injected, considerable amounts of benzoic acid appeared in the urine: N-methyl-, NN-dimethyl-, N-ethyl-, NN-diethyl-, and N-propyl-benzamide; hexahydro-N-methyl- and -NN-dimethyl-benzamide. D. M. N.

Function of the spleen. I. Nitrogenous metabolism. II. Uric acid formation. III. Aminoacid formation. K. SODA (J. Biochem. Japan, 1937, 26, 285—295, 297—306, 307—317).—I. Blood perfused through the dog's spleen experiences an increase in NH_3 -N and a decrease in urea-N, the creatine and creatinine content remaining unchanged. The uric and amino-acid-N contents increase to parallel extents, probably indicating a common relationship to the degradation of blood-corpuscles in the spleen.

II. Perfusion as above increases the contents of uric acid, free, nucleoside-, and nucleotide-purine, and inorg. and acid-sol. P. Hence uric acid arises not only from preformed adenylic acid in the blood but also from the more complex nuclein of the spleen. The relationship between formation of uric acid and degradation of corpuscles in the spleen is discussed.

III. The amino-acid content of blood perfused through the spleen is first increased and then decreased, indicating that formation of amino-acids is a vital function of the spleen, probably one of degradation of the blood-corpuscles. The levels of both mono- and di-amino-acids are increased.

F. O. H.

Nitrogen retention in a child during undernutrition. E. S. CONN (Proc. Soc. Exp. Biol. Med., 1937, 37, 496—499).—An obese child, underfed (600 cal.) for 85 days, lost 12 kg. in wt. but retained 49 g. of N. V. J. W.

Intermediary metabolism of tryptophan. XXVI. Biochemistry of d-kynurenine. Y. KOTAKE, jun., and N. ITō (J. Biochem. Japan, 1937, 26, 161—165; cf. A., 1937, III, 345).—B. coli, B. subtilis, or B. proteus from rabbit's intestine do not decompose d-tryptophan, neither kynurenine nor kynurenic acid being formed. Oidium lactis asymmetrically attacks dl-kynurenine, d-kynurenine and a small amount of kynurenic acid being produced. d-Kynurenine administered to rabbits does not yield kynurenic acid in the urine, which, however, gives a positive diazo-reaction. F. O. H.

Behaviour of α -hydroxy- δ -guanidovaleric acid in the phloridzin-diabetic animal. H. MÜLLER and H. BRÄUTIGAM (Z. physiol. Chem., 1938, 251, 43–46).— α -Hydroxy- δ -guanidovaleric acid forms sugar in the phloridzin-diabetic animal; it behaves like the corresponding amino-acid, arginine. On injection it increases the creatinine and inorg. and org. phosphate excretion. D. M. N.

Arginine, arginase, and creatine in vertebrate embryos. A. V. PALLADIN and E. J. RASHBA (Ukrain. Biochem. J., 1937, 10, 193—242).—Arginine and creatine decrease gradually during development of chick embryos, reaching adult vals. at 40—50 days after hatching. Arginase, which is activated by Mn", follows a similar course; in fœtal chick liver it has normal and in fœtal rabbit liver high vals.

P. G. M.

Metabolism of cystine and methionine. II. Availability of *d*- and *l*-methionine and their formyl derivatives in promotion of growth. R. W. JACKSON and R. J. BLOCK (J. Biol. Chem., 1938, 122, 425-432).—Both *d*- and *l*-methionine effectively supplement a ration deficient in cystine and methionine. Formyl-*l*- but not formyl-*d*-methionine can be utilised for growth. J. N. A.

Changes in the physiological condition of the new-born infant. V. Synthesis of indican. T. SHOJI (J. Biochem. Japan, 1937, 26, 167—179; cf. A., 1938, III, 49).—The average normal excretion of indican in suckling puppies is 0.03-0.20 mg. daily and in adult dogs up to 8.6 mg. Following intravenous injection of indole, 5.8 and 15% is excreted as indican in dogs 1—5 and 10—35 days old, respectively, whilst in adult dogs the val. is 37%. The low excretion and synthesis of indican in young dogs is due to low oxidising and synthesising powers of the liver and lungs and to excretory dysfunction of the kidneys.

F. O. H. Mercapturic acid synthesis in animals. VIII. *I*-Cystine, *dI*-methionine, glutathione, and taurine in relation to synthesis of mercapturic acids in the rat. J. A. STEKOL (J. Biol. Chem., 1938, 122, 333—342).—The synthesis of l- α -naphthalene- and *p*-bromophenyl-mercapturic acids from naphthalene and bromobenzene is augmented by *l*-cystine and *dl*methionine, but not by glutathione or taurine, when fed to rats on a low-S diet. *p*-Bromophenylcysteine can be directly acetylated in the body to yield *p*bromophenylmercapturic acid, which is not necessarily derived from glutathione. P. G. M.

Choline ester formation by pancreas. H. S. MAHAL and B. B. DIKSHIT (Current Sci., 1937, 6, 219).—Dog's cortex and pancreas *in vitro* form choline ester at rates of about 1 μ g. and 0.25 μ g. per g. of fresh tissue per hr., respectively. Formation of the ester by pancreas was the same with or without O_2 ; in absence of O_2 both brain and pancreas form H₂S. The activity of the choline esterase of the pancreas is twice that of the cortex. J. N. A.

Fate of dehydrocholic acid in the rabbit's organism. T. FUKUI and S. ISHIDA (J. Biochem. Japan, 1937, 26, 319—322).—Dehydrocholic acid, intravenously injected into rabbits, is excreted in the urine partly unchanged and partly as 7-hydroxy-3 : 12-diketocholanic acid (cf. A., 1937, III, 357). F. O. H.

Fate of reductodehydrocholic acid in the organism of the toad; 3-hydroxy-12-ketocholanic acid. K. KYOGOKU (Z. physiol. Chem., 1937, 250, 253-257).-When a-reductodehydrocholic acid (made by catalytic hydrogenation in alkaline medium) is given to the toad, β -3-hydroxy-7:12diketocholanic acid can be obtained from the urine in low yield. If the β -reducto-acid was given, the yield was not increased. It appears that in the toad organism, the greater part of the β -reducto-acid is converted into the α -acid; both acids may be oxidised to the dehydro-cholic acid, and part of the latter is then reduced to β -3-hydroxy-7: 12-diketocholanic acid. The hæmolytic activity of the α -3-hydroxy-7:12ketocholanic acid stands to that of the β -acid in the relation of 1:4 if goat blood cells are used; with ox cells the ratio is 1:8. On the other hand, the α acid has much greater capability of activating lipases; in accordance with this the α -acid has greater D. M. N. surface activity.

Formation of phosphatides in liver perfusion experiments. L. A. HAHN and G. C. HEVESY (Biochem. J., 1938, **32**, 342—344).—On shaking *in* vitro with radioactive Na₂HPO₄, the amount of newlyformed phosphatide is similar whether normal or lipamic blood is used. In perfusion experiments, lipamic blood contains more newly-formed phosphatide $(2 \cdot 7 %)$ than normal blood $(1 \cdot 5 %)$, as also does the liver in these experiments. P. G. M.

Influence of diet on the rate of synthesis of phospholipins in various tissues. C. ARTOM, C. PERRIER, M. SANTANGELO, G. SARZANA, and E. SEGRÈ (Boll. Soc. ital. Biol. sperim., 1937, 12, 708—710).—Further to conclusions already published (A., 1937, III, 345), the relative syntheses of phospholipins by intestine and liver are dependent on the route and method of administration of fat and phosphate (containing radioactive P as indicator). In the pregnant rat, the radioactive P occurs both as inorg. and org. P in the placenta and foetus. Phospholipin metabolism of, e.g., liver and intestine is dependent on, whilst that of, e.g., skeletal muscle is independent of, the fat metabolism of the whole organism.

F. O. H.

Formation of radio-phospholipin by isolated tissues of the rat. A. ROBINSON, I. PERLMAN, S. RUBEN, and T. L. CHAIKOFF (Nature, 1938, 141, 119— 120).—Slices of liver, intestine, and kidney from the rat were kept in oxygenated radioactive phosphate solutions for $\frac{3}{4}$ —4 hr. Phospholipin formation occurred in all the tissues, being highest in the kidney. The addition of glucose increased the synthesis in the liver and intestine. C. A. K.

Fat metabolism. VIII. Feeding of dogs with sodium salts of normal saturated dicarboxylic acids. P. E. VERKADE, J. VAN DER LEE, A. J. S. VAN ALPHEN, and M. ELZAS (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 771—779; cf. A., 1937, III, 260).—Saturated aliphatic dicarboxylic acids having more than 6 C, when administered to dogs, are excreted in urine to extents which diminish as the series is ascended. In each case acids lower in the series are also present. Normal acids of this type are catabolised by unilateral β -oxidation and also by ω -oxidation followed by bilateral β -oxidation of the intermediates. The relation of these observations to the diacidogenic character of simple dietary glycerides is considered. A. G. P.

Substances of the vegetable-auxin type in the evolution of *Bombyx mori*, L. H. BERRIER (Comp. rend., 1937, 205, 1009—1011).—The accumulation of auxin-like products by *B. mori* is max. when the larva begins to feed, and disappears when a cocoon is formed. J. D. R.

Alimentary utilisation of hexitols by the mouse. M. LAFON (Compt. rend. Soc. Biol., 1937, 126, 1147—1149).—Sorbitol can be utilised by mice, whilst mannitol is toxic. H. G. R.

Ovarian hormone and carbohydrate metabolism. B. BRUNELLI (Arch. int. Pharmacodyn., 1935, 49, 243—258; Chem. Zentr., 1936, i, 4586).— Administration of follicular hormone causes hyperglycæmia and mobilisation of liver-glycogen. Corpus luteum extract produces the reverse effects. The similarity of action of the two hormones with that of adrenaline and insulin respectively is discussed.

A. G. P. Metabolism of *l*-glucosan. T. KIMURA (Jap. J. Gastroenterol., 1935, 7, 179—201).—Administration of *l*-glucosan (from starch by heating, distillation in vac., and crystallisation from alcohol) to rabbits resulted in approx. 40% absorption in 3 hr. Bloodglucosan increased and remained above normal for some time at higher levels of feeding. Approx. 50% of the glucosan was recovered in urine. Possible formation of glycogen from glucosan is indicated.

Сн. Авз. (р)

Carbohydrate metabolism in anorexia nervosa. J. H. SHELDON and F. YOUNG (Lancet, 1938, 234, 257—259).—The low, flat glucose-tolerance curve in a case of anorexia nervosa was attributed to the predominance of carbohydrate in the diet, and not to any endocrine abnormality. C. A. K.

Effect of fructose on glucose-tolerance curve. J. P. FLETCHER and E. T. WATERS (Biochem. J., 1938, 32, 212—217).—Fructose when injected intravenously into a fasting dog does not decrease the concn. of blood-glucose, but it lowers the glucosetolerance curve of normal dogs and also that of depancreatised dogs receiving a steady supply of insulin. It is concluded that the effect in normal dogs is not due to stimulation of the pancreas to give increased secretion of insulin, but that fructose catalyses the utilisation of glucose, probably affecting the glycogen-forming mechanism of the liver.

J. N. A. Glucose tolerance in the aged. M. D. DEREN (J. Lab. clin. Med., 1937, 22, 1138—1141).—Glucosetolerance tests on 50 subjects over 55 years of age showed diminished tolerance, although the fasting blood-sugar was usually normal. T. H. H.

One-hour two-dose glucose-tolerance test. S. E. GOULD (Amer. J. clin. Path., 1937, 7, 474–481). —The results of the ordinary 3-hr. glucose-tolerance test, the 6-hr. two-dose test, and the 1-hr. two-dose test (the last as judged by the criteria of Exton and Rose and also by those of Gould, Altshuler, and Mellen) were compared in 215 patients. The 1-hr. test was superior particularly on the criteria of Gould *et al.* and in the diagnosis or exclusion of diabetes mellitus in arteriosclerotic patients.

C. J. C. B.

One-hour two-dose glucose-tolerance test. J. S. SWEENEY, J. J. MUIRHEAD, and L. E. ALLDAY (Amer. J. clin. Path., 1937, 7, 482—489).—Groups of normal healthy young adults (i) starved, (ii) ate only fats, (iii) ate only protein, (iv) ate only sugars, for 48 hr. One-hr. two-dose glucose-tolerance tests were then performed. The results were those of a diabetic especially in the fasting and high-fat diet groups, as are the results in ordinary glucose-tolerance tests under those conditions; the blood sugar did not rise to such high figures and returned to less abnormal vals. at the end of 2 hr. than in the ordinary tolerance tests. C. J. C. B.

"Fat-sparing" action of glucose in the absence of insulin. I. A. MIRSKY and F. A. SENIOR (Proc. Soc. Exp. Biol. Med., 1937, 37, 505— 507).—Intravenous administration of glucose causes no diminution in blood-fat of depancreatised dogs but causes a marked decrease in their blood-ketones. V. J. W.

Tissue metabolism. XI. Action of tumour slices and extracts on different carbohydrates. E. BOYLAND and M. E. BOYLAND (Biochem. J., 1938, 32, 321-331).-Extracts of sarcomas and carcinomas produce lactic acid from glucose and fructose in the presence of cozymase, adenylic acid, and traces of hexose diphosphate, the optimum concn. being 0.2and 10.0%, respectively. Extracts of tumours produce lactic acid more rapidly from fructose, whilst slices produce it from glucose 3-4 times as rapidly as from fructose. Tumour slices produce no lactic acid from glycogen because of its non-diffusibility, whilst extracts do produce it. dl-Glyceraldehyde and NaF inhibit tumour glycolysis of glycogen, P. G. M. glucose, and fructose.

Renal diabetes with signs of pancreatic deficiency. A. W. VEGTER (Jahrb. Kindhlk., 1937, 150, 282—287).—A child, 3 months old, showed considerable glycosuria with normal blood-sugar and a normal blood-sugar curve after administration of 10 g. of glucose. At the age of 3 years the blood-sugar curve after administration of 30 g. of glucose was that of a diabetic. A. S.

Influence of increased metabolism on β hydroxybutyric acid utilisation. I. A. MIRSKY and R. H. BROK-KAHN (Amer. J. Physiol., 1937, 120, 446—450).—An increased metabolism consequent to dinitrophenol or thyroid administration markedly increases the rate of ketone and glucose utilisation by the extrahepatic tissues. No definite "ketolytic" ratio *in vivo* between carbohydrate and ketone utilisation was demonstrated. It is suggested that ketogenesis may proceed without any detectable ketosis if the rate of ketone utilisation equals or exceeds the rate of formation, and that glucose exerts its antiketogenic action solely by its ability to suppress fat oxidation in the liver.

M. W. G.

Inhibition of glycolysis by glyceraldehyde. Z. BAKER (Biochem. J., 1938, 32, 332—341).— Anaërobic glycolysis of tumour, brain, testis, and embryo is inhibited by dl-glyceraldehyde, whilst that of liver and kidney is stimulated, and lactic acid production by tumour slices and muscle extract is unaffected. The inhibition of tumour, but not brain, glycolysis by glyceraldehyde is prevented by pyruvic acid; Ca α - and Na β -glycerophosphate, glutathione, and muscle-adenylic acid have no effect. Propaldehyde, benzaldehyde, etc. and dihydroxyacetone do not inhibit glycolysis. P. G. M.

Metabolism studies on age disposition to ketosis in human beings. W. HEYMANN (J. Pediat., 1938, 12, 21-25).-36 healthy persons from 2 months to 35 years of age were placed for 3 consecutive days on a ketogenic diet with the ratio of 2.5:1 and urinary ketones determined daily by Embden and Schmitz's iodometric titration method. Ability to develop ketonuria began at the age of 7-8 months and the tendency increased during the first 4 years of life, reached a broad peak at 4-8 years, and decreased during prepuberty to adult level. When acetone or Na acetoacetate was fed to 9 healthy infants and 14 children receiving normal diets, no quant. difference in ketonuria was found in these two groups. The age disposition to ketonuria is attributed to difference in ability to produce ketones rather than to utilise, destroy, or excrete them; the pituitary gland of infants may produce less ketogenic principle than in children.

C. J. C. B.

Formation of citric and α -ketoglutaric acids in the mammalian body. H. A. KREBS, E. SALVIN, and W. A. JOHNSON (Biochem. J., 1938, 32, 113— 117).—Citric and α -ketoglutaric acids appear in the urine of rabbits after intravenous infusion, and of rats following subcutaneous injection, of succinic, fumaric, malic, and oxalacetic acids. Malonic acid is not metabolised but inhibits the enzymes causing breakdown of succinic acid, which then appears in the urine. P. G. M.

Citric acid in tissue metabolism. F. L. BREUSCH (Z. physiol. Chem., 1937, 250, 262-280).-Citric acid added to tissues disappears; if isocitric acid and cis-aconitic acid are added, formation of citric acid takes place. These results support the view of Knoop and Martius that citric, isocitric, and isoaconitic acids can be reversibly converted into one another in the tissues. At the equilibrium point there is at least 75% of citric acid. The transformation of one acid into the other takes place in mouse tumour, although this tissue cannot bring about disappearance of citric acid. Citric acid added to normal tissue disappears aërobically more quickly than anaërobically. Reversible dehydrogenation of tricarballylic acid does not occur in liver or muscle, so that the change of tricarballylic acid into cisaconitic acid cannot have a catalytic function. Whether the reversible change ketotricarballylic acid \rightarrow isocitric acid might have a catalytic function could not be decided, as the former acid could not be obtained pure. The citric acid cycle as suggested by Krebs could not be demonstrated. No citric acid was found to be formed from oxalacetic acid when added to tissues; if conc. neutralised oxalacetic acid solutions were kept, a condensation product was formed, from which tissues could produce citric acid by decarboxylation and oxidation. D. M. N.

Biology of oxalic acid. I. Micro-determination in urine and blood. II. Oxalogenic compounds in urine. III. Oxalic acid excretion in rabbits. IV. Oxalic acid in human urine during starvation and unbalanced diet. B. FLASCHENTRÄGER and P. B. MÜLLER (Z. physiol. Chem., 1938, 251, 52—61, 61—69, 69—74, 74—77).— I. Oxalic acid was determined, in amounts of 0.05— 0.8 mg., in urine, blood, and serum, recovery being 83—98%. The method consists in extraction with ether; pptn. as Ca salt; prep. and distillation of the ethyl ester; pptn as Ca salt; acidification and steamdistillation; titration with KMnO₄.

II. Human urine (made acid to Congo-red), on repeated extraction with ether, continually yields small quantities of oxalic acid. Tests showed that the action of acid or alkali on oxaluric acid, parabanic acid, allantoin, uric acid, alloxan, creatinine, glucose, and ascorbic acid yields some oxalic acid; none was formed from glycollic acid or glycine. The amounts of oxaluric acid, parabanic acid, and alloxan in urine were not enough to explain the increase in oxalic acid. The new formation of oxalic acid seems to be the result of acid or alkaline hydrolysis and perhaps of a Cannizzaro rearrangement. Oxalic acid is unstable to H_2O_2 at 90° and $p_{\rm H}$ near neutrality; it is stable towards HgO and alkali. If the urine is treated with HgCl, and alkali, still larger amounts of oxalic acid are formed; under these conditions considerable amounts of oxalic acid arise from glycollic acid, glycine, glucose, uricacid, and creatinine. III. In rabbits, quant. excretion of oxalic acid administered was only observed if the dose was not greater than 2 mg. per kg. per day. With larger amounts, whether fed or injected, only a part (30-70%) had appeared in the urine after a month. The rate of excretion is greatly affected by accompanying substances in the diet; e.g., NaHCO₃ greatly increased the rate. The storing of oxalate and its very slow excretion has the effect of preventing damage to the kidney cells and disturbance of the Ca metabolism.

IV. The effect of different diets on oxalate excretion in the urine was studied in man; a day's starvation preceded the test in order to reduce bacterial action in the intestine. Fat diet does not cause a rise in oxalate excretion above the fasting val., but carbohydrate or protein diet causes a marked rise. D. M. N.

Ethyl alcohol metabolism in animal tissues. L. F. LELOIB and J. M. MUÑOZ (Biochem. J., 1938, 32, 299—307).—In rat's liver Q_{alcohol} is 7—9; it is lowered by fasting to 5. It is approx. 3 in pigeon's liver. O₂ uptake is increased in the kidney by alcohol but lowered in other organs. More than 50% of alcohol metabolised aërobically in the liver is converted into acetic acid, the level of metabolism being increased by pyruvic and lactic acid, alanine, etc. Pyruvic and oxalacetic, but not fumaric, acid increase the anaërobic level of metabolism. Iodoacetate, fluoride, phloridzin, etc. decrease oxidation of alcohol, whilst 2:4-dinitrophenol at a concn. of $1\cdot 1 \times 10^{-5}$ M increases, and in higher concn. decreases, oxidation. P. G. M.

Water balance in batrachians. M. P. REY (Ann. Physiol. Physicochim. biol., 1937, 13, 1081—1145).— The green frog, with anus occluded, when immersed in water absorbs an amount through the skin equal to that of the serum in $2\frac{1}{2}$ hr. The ratio water absorbed (p) to wt. (w) is about 0.36. The val. of p/w diminishes as w increases. At very low temp. absorption is still considerable. In air a regulatory mechanism exists which diminishes renal activity when water loss by the skin is increased. The water content of tissue increases in fasting. D. T. B.

Physical-chemical changes in the egg during embryonic development of birds. I. Changes in $c_{\rm H}$ in relation to embryonic development in eggs of domestic fowl (hen, turkey, duck, goose). II. Acid-base reserve in hens' eggs during embryonic development. N. M. SCHKLJAR (Ukrain. Biochem. J., 1937, 10, 379-406, 407-418).-I. The $p_{\rm H}$ of the white of the fresh egg is 8.5; this falls to $7 \cdot 2$ on the 16th day in hens and on the 22nd day in turkeys. The $p_{\rm H}$ of duck and goose eggs is 0.2-0.3lower. The yolk (semi-solid fraction) is mildly acid $(p_{\rm H} 6.2)$, becoming neutral on the 8th day (16th day in geese). The $p_{\rm H}$ of the semi-liquid fraction of the yolk is const. throughout development at 7.7. The amniotic fluid is originally alkaline, becoming gradually neutral, whilst the allantoic fluid is mildly alkaline, reaches a max. on the 10th day, and gradually becomes acid $(p_{\rm H} 5.1-6.0)$. Vals. are given for the $p_{\rm H}$ of various other organs.

II. Egg-albumin can be titrated with acid in presence of phenolphthalein only during the first 4 days. The base reserve per g. is increased owing to loss of water during incubation. The initial base reserve of the amniotic fluid is low but increases sharply at the 13th, reaching a maximum at the 16th day; the allantoic fluid behaves similarly but to a less degree. Acid substances in the semi-solid yolk decrease up to the 6th day and thereafter remain const. A sharp rise in the base reserve of the semiliquid yolk takes place at the 10th day. P. G. M.

Metabolism in the duck's egg during embryonic development. II. Total ash. E. M. KOSHUCHAR (Ukrain. Biochem. J., 1937, 10, 663— 693).—The changes in total ash of shell, embryo, yolk, albumin, amniotic fluid, and embryonic brain during development of ducks' eggs are recorded and discussed. E. M. W.

 As the sweating was repeated the Cl' content of the sweat increased while that of the urine decreased; the tissue-Cl' depletion was greater than the blood-Cl' indicated. The $p_{\rm H}$ of the sweat increased with succeeding periods of sweating. The CO₂ content of the blood rose in half the cases. C. J. C. B.

Effect of large doses of iron on the absorption of phosphorus. J. F. BROCK (Clin. Sci., 1938, 3, 37).—The Ca, P, and Fe balances during the administration of large doses of Fe were studied. There is an increase in the fæcal mineral ash, excluding the unabsorbed Fe, due to an increase of P and possibly an increase in S. Fæcal Ca is not increased. The increase in fæcal P is thought to be due to the pptn. of P as an insol. Fe salt in the intestine. A. N. D.

(q) PHARMACOLOGY AND TOXICOLOGY.

Determination of sulphanilamide in blood and other body-fluids. H. PROOM (Lancet, 1938, 234, 260).—A routine method (using trichloroacetic acid, NaNO₂, and dimethyl- α -naphthylamine) is described which has been found satisfactory for the determination of sulphanilamide in blood, milk, cerebrospinal fluid, and urine. C. A. K.

Discussion on treatment of bacterial diseases with substances related to sulphanilamide. (Proc. Roy. Soc. Med., 1937, 31, 149-166).-L. COLEBROOK. Sulphonamidochrysoidine ("red prontosil"), itself inactive in vitro, is converted into paminobenzenesulphonamide in the body; when administered both readily kill streptococci in the blood, are of low toxicity and readily diffusible, and enter the urine, cerebrospinal fluid, and milk. The efficacy of the drug in the treatment of puerperal fever is emphasised. With the possible exception of staphylococcal infections, those due to hæmolytic streptococci alone among the infections of the genital tissues respond to the drug. Cyanosis, accompanied by methæmoglobinæmia or sulphæmoglobinæmia or both, often develop. If accompanied by prostration, the drug should be discontinued. "Drug fever" or slight mental or visual disturbances may occur. Anæmia, agranulocytosis, and morbilliform rashes were not observed. There are probably idiosyncrasies among patients and possibly also variations in the purity of the drugs, which are better tolerated by those in bed than by the ambulant.

G. A. H. BUTTLE. In non-hamolytic streptococcal, meningococcal, and gonococcal infections the val. of the sulphanilamide group is doubtful; *B. coli* infections of the urinary tract may be cleared in a striking manner, and possibly also those due to *B. proteus.* S. facalis is resistant.

M. MITMAN. The effect of the drugs in scarlet fever is disappointing; in erysipelas, excellent results were obtained.

E. P. POULTON. Favourable results were obtained in some cases of acute rheumatism and rheumatoid arthritis ("occult" hæmolytic streptococcal infections). W. J. G.

Mechanism of the action of prontosil. E. UNSHELM and W. HOFMANN (Z. ges. exp. Med., 1937, **102**, 43—44).—Prontosil does not influence the R (A., III.) leucocytosis and fever following experimental production of abscesses by subcutaneous injections of turpentine in dogs or quicken the healing of turpentine abscesses. A. S.

Therapy of experimental staphylococcus infections with sulphanilamide compounds. R. R. MELLON, L. E. SHINN, and J. MCBROOM (Proc. Soc. Exp. Biol. Med., 1937, 37, 563-565).-Mice were given intravenous doses of a virulent staphylococcus culture. 4 groups of 21 each were given by mouth sulphanilamide, disulphanilamide, dimethyldi-sulphanilamide, and no drug respectively. Dosage was 20 mg. daily by mouth for 15 days, and the experiment continued for 32 days. All the treated groups had a larger survival percentage than the controls, the largest being 62% for disulphanilamide as against 14% for the controls, but there were more early deaths in the treated groups. In another series of experiments treatment was postponed until the 3rd day after infection, and in these the dimethyl derivative gave a smaller percentage survival than the controls. V. J. W.

Sulphanilamide in streptococcal meningitis. T. CAWTHORNE (Lancet, 1938, 234, 304—308.— Two out of 3 cases of streptococcal meningitis were cured by sulphanilamide. The other one died.

C. A. K.

Sulphanilamide and virus diseases. E. B. MCKINLEY, E. G. ACREE, and J. S. MECK (Science, 1938, 87, 43—44).—Sulphanilamide had no action on infections produced by the virus of poliomyelitis (in monkeys), rabbit fibroma, and rabbit myxomatosis. The negative effect may be due to the intracellular position of viruses, in contrast to the intercellular location of bacteria sensitive to the drug.

C. A. K.

Sulphanilamide in gonorrhœa. P. DUREL (Presse méd., 1938, No. 2, 21-24).-80% of 170 male and 70 female patients treated with sulphanilamide (less than 3 g. daily) and permanganate lavage were completely cured in less than 3 weeks. Chronic cases responded to this treatment particularly well. P. C. W.

Sulphanilamide and di-(p-acetamidophenyl)sulphone in gonorrhœa. M. PALAZZOLI and D. BOVET (Presse méd., 1938, No. 6, 99—102).—23 cases of gonorrhœa in the male were treated with sulphanilamide and 130 cases with di-(p-acetamidophenyl)sulphone; 18 of the latter were chronic cases. 3 g. daily of each substance alone did not give encouraging results but when given in association with permanganate lavage cure was rapid (70% in less than 20 days). Only one of the 18 chronic cases failed to respond in 15 days to the sulphone, which was considerably less toxic than sulphanilamide.

P. C. W.

Treatment of infections by [4:4'-]diacetoxydiphenylsulphone. C. LEVADITI, A. GIRARD, and A. VAISMAN (Compt. rend. Soc. Biol., 1938, 127, 19—21).—73% of mice infected with meningococcus (and 40% infected with gonococcus) treated with 4:4'-diacetoxydiphenylsulphone recovered. Little or no success was obtained in pneumococcal and streptococcal infections. D. T. B.

4-Nitro-4'-aminodiphenyl sulphoxide and its action on experimental toxi-infection in mice. C. LEVADITI, A. GIRARD, A. VAISMANN, A. RAY, and G. RICHARD (Compt. rend., 1937, 205, 1018-1020). -Of 75 compounds investigated for antigonococcal action, the best found was 4-nitro-4'-aminodiphenyl sulphoxide, which is 50-100 times as active as p-aminobenzenesulphonamide. Antigonococcal activity is not parallel with antistreptococcal activity, the latter being most pronounced in the sulphones and sulphamides, the former in the sulphoxides. The antistreptococcal activity of sulphamides is increased by diazotisation, but this decreases the antigonococcal action. Substituents other than p-, particularly CO₂H and ·SO₃H, reduce activity in all cases. Curative and tolerated doses of the above sulphoxide are given, and the activities of certain of its N-substituted derivatives are mentioned.

J. D. R.

Mechanism of antipneumococcal chemotherapy. C. LEVADITI, A. VAISMAN, and D. KRASS-NOFF (Compt. rend. Soc. Biol., 1938, **127**, 22—25).— Certain sulphamide derivatives antagonise pneumococci by preventing through the agency of living tissues the formation of a capsule by which the microbe resists the phagocytic influence of defensive elements. D. T. B.

Polyneuritis in man and pigeons following administration of sulphonamides. H. HUELL-STRUNG and F. KRAUSE (Dtsch. med. Wochr., 1938, 64, No. 4, 114—116).—Severe polyneuritis was observed in a patient after therapeutic doses of sulphonamide preps. Pigeons fed with the same prep. ("Prontosil," "Urilon ") also developed severe polyneuritis. A. S.

Toxicity of sulphanilamide and diethylene glycol. C. F. POE and P. C. WITT (Proc. Soc. Exp. Biol. Med., 1937, 37, 559—560).—The lethal doses by either oral or intraperitoneal administration were about 12.5 g. per kg. of the glycol and 2.6 g. per kg. of the amide for young white rats. The administration of HCl with the sulphanilamide increased its toxicity about 4 times. V. J. W.

Chemotherapy of bacterial infections illnesses. F. MIETZSCH (Ber., 1938, 71, [A], 15–28).—A lecture. H. W.

Anti-endotoxic chemotherapy. C. LEVADITI, A. VAISMAN, and L. REINIÉ (Compt. rend. Soc. Biol., 1937, **126**, 1092—1095).—Certain S-containing derivatives of benzene (particularly 4-nitro-4'-aminodiphenyl sulphoxide) neutralise *in vivo* the endotoxins of *Meningococcus* and *B. ærtrycke* but are inactive to that of *Staphylococcus*. H. G. R.

Anti-endotoxic chemotherapy. C. LEVADITI and A. VAISMAN (Compt. rend., 1937, 205, 1108—1110, cf. A., 1937, III, 436).—4-Nitro-4'-aminodiphenyl sulphoxide administered orally protects mice against the effect of intraperitoneal injections of gonococci endotoxin. Treated animals acquire no antigonococcal immunity. A. L.

Bayer 205 (Germanin) and Antrypol. I. Determination of small amounts of Bayer 205 (and Antrypol). II. Persistence of Bayer 205

in blood stream after injection into animals. W. G. DANGERFIELD, W. E. GAUNT, and A. WORMALL (Biochem. J., 1938, 32, 59-70).-A method based on that of Lang (A., 1931, 981) is described. Baver 205 or Antrypol is hydrolysed by conc. HCl and the amines produced are diazotised and coupled with methyl-a-naphthylamine. The red colour so produced is compared with that obtained from standard solutions of Bayer 205. 0.2 mg. of Bayer 205 per 100 c.c. of water can be readily detected, and accurate results are obtained when the concn. is greater than 0.6 mg. per 100 c.c. of water or blood plasma. The method, at present, is unreliable with urine. After intravenous injection of Bayer 205 into rabbits and dogs, the amount in plasma falls rapidly in the first few days, but afterwards the decrease is less rapid. and after injection of 0.1 g. per kg. into a rabbit there is still a significant amount, more than 1 mg. per 100 c.c., in the plasma after 5-6 months. Rabbits which have received several small doses of Bayer 205 over a period of a few weeks have more in the plasma after a given time than those which received one injection of the same total amount. The significance of these results is discussed. J. N. A.

Quinine solutions for parenteral use. E. H. VOGELENZANG (Pharm. Weekblad, 1937, 74, 1660— 1661).—Measurements of the quinine content of blood after intramuscular injection shows that the highest conces. are registered with a mixture of quinine hydrochloride and antipyrine (3:2 or (3:2.4) neutralised to $p_{\rm H}$ 7.2. S. C.

Cinchona and other alkaloids in bird malaria. III. G. A. H. BUTTLE, T. A. HENRY, W. SOLOMON, J. W. TREVAN, and E. M. GIBBS (Biochem. J., 1938 32, 47-58; cf. A., 1934, 681).-The antimalarial activities of a series of ethers of apoquinine, apoquinidine, dihydrocupreine, and dihydrocupreidine, together with various quinine and quinidine transformation products, were determined. The activities of epi-C⁹-quinine and -quinidine are much less than those of quinine and quinidine, whilst epi-C9-dihydroquinine has the same activity as quinine. apo-Quinidine methyl ether is more active than either α - or β -isoquinine. Conversion of the phenolic *l*-bases apoquinine and isoapoquinine into their methyl ethers causes a reduction in activity whilst the converse is true when the *d*-base, *apoquinidine*, is methylated. The α -, β -, and γ -isoquinidines are almost inactive. Each of the homologous series of apoquinine and dihydrocupreine ethers can be divided into two series containing members with odd and even no. of C, and there is a definite tendency in the four series for the quinine ratio to rise to a max. and then decrease as the series is ascended. With the dihydrocupreidine ethers there is a rise in activity as the side-chain is increased in length. Niquidine, isoniquidine, and niquine are active, the first being the most active of the d cinchona alkaloids yet known, and having a quinine ratio of 1.45. (For new compounds described see A., 1938, II, 118.) J. N. A.

Treatment of malaria. Study of the therapeutics and prophylaxis of malaria by synthetic drugs as compared with quinine. 4TH GENERAL REPORT OF MALARIA COMMISSION (J.R.A.M.C., 1938, 70, 110-117).

Chemotherapeutic effect of ruthenium in experimental syphilis. F. JAHNEL (Z. Immunitätsforsch., 1937, 91, 312—317).—Ru-red and RuCl_3 in sub-lethal doses had no curative effect on rabbits with testicular syphilitic chancres. B. C. J. G. K.

Iodobismitol in the treatment of syphilis. C. W. BARNETT and G. V. KULCHAR (J. Amer. Med. Assoc., 1937, 109, 1715—1717).—The therapeutic val. of iodobismitol used alone or in alternation with arsenicals was observed over the past 6 years in 827 patients with various forms of late syphilis. Judged by the rate of involution of lesions, symptomatic response, effect on the serologic reaction of blood and cerebrospinal fluid, and relative freedom from reactions, this Bi prep. proved satisfactory for the treatment of syphilis. R. L. N.

Bactericidal properties of certain organomercuriacetates. G. H. COLEMAN, L. A. WEED, and C. D. MYERS (J. Amer. Chem. Soc., 1937, 59, 2703—2704).—The following corr. m.p. are recorded for the derived acetoxymercuri-compounds: Me 127—128°, Et 69—69.8°, Pr^a 54.5—55.1°, Bu^a 52.5— 53.2°, Ph 151.8—152.8°, CH₂Ph 128—128.8°, and p-C₆H₄Me 149.9—151°. The aliphatic compounds increase in toxicity to six bacteria with increasing mol. wt., but all are less toxic than the above and three other aromatic derivatives; the aromatic compounds are about equally toxic. R. S. C.

Effect of synthetic surface-active materials on bacterial growth. II. J. KATZ and H. LIPSITZ (J. Bact., 1937, 33, 479—482; cf. A., 1936, 383).— Surface-active substances possessing a cyclic structure are more effective in inhibiting growth of *Myco*bacterium smegmatis than are those having long aliphatic chains. Data are given for a Na sulphonate of a butylated o-hydroxydiphenyl, a quaternary NH_4 salt obtained by the reaction of dimethyl sulphate with the stearyl ester of unsym. diethylethylenediamine, and for the N-methyltauride of oleic acid.

A. G. P. Antiseptics. Alkylpyrocatechols.—See A., II, 96.

Treatment of surgical infections with solutions of a new chlorine compound of low potential. H. A. GOLDBERGER (West. J. Surgery, Obstet. Gynæcol., 1936, 44, 105—116).—NN'-Dichloroazodicarbonamidine ("Azochloramide") is recommended for treatment of infected wounds. CH. ABS. (r)

Pathological findings in antimony poisoning. G. FRANZ (Arch. exp. Path. Pharm., 1937, 186, 661-670).—The tissues principally affected in rabbits poisoned with tartar emetic are the liver, kidney, and heart, the first to show degenerative change being the convoluted tubules of the kidney. Fatty degeneration, which then sets in in the liver, affects first the centre of the lobule when the Sb is given by the mouth or the periphery when it is given by injection. There is no evidence that the action is primarily on the capillaries : Sb is a direct parenchyma poison. The affected tissues contain granules, thought to be of SbS₃. T. B. H. Hydrogen arsenide poisoning. M. KIESE (Arch. exp. Path. Pharm., 1937, 186, 337—376).—Rabbits were poisoned by breathing for 7 hr. a day for several weeks a gaseous mixture containing 4—50 µg. per l. of AsH₃. Pathological changes were confined to the blood, which shows extensive hæmolysis, and consequent loading of the bone marrow and other organs with Fe. As is stored mainly in spleen, liver, bone marrow, and red cells, and later in the hair. T. B. H.

Does digitalis protect against diphtheria toxin? C. W. EDMUNDS and R. G. SMITH (J. Pharm. Exp. Ther., 1937, **61**, 37—47).—The results of daily administration of digitalis, ouabain, or strophanthin $(\frac{1}{4}$ m.l.d.), following or preceding injection of diphtheria toxin (m.l.d.) in guinea-pigs, afforded no support to the theory that these drugs protect against the toxin. E. M. S.

Action of digitalis on rhythmically acting leech muscle. H. BUSQUET (Compt. rend. Soc. Biol., 1937, 126, 839—841).—Digitalis slows the frequency of leech muscle made to contract rhythmically; this is not antagonised by atropine. D. T. B.

Effect of digitalis glucosides on oxygen consumption by the heart. H. GREMELS (Arch. exp. Path. Pharm., 1937, 186, 625-660).—Digitalis glucosides which lower O_2 consumption of the insufficient heart have this effect also on the normal heart-lung prep. The vagus exerts the same action; the denervated heart has always an excessive O_2 consumption, which is reduced by strophanthin or digitoxin. These glucosides similarly intensify the effects of acetylcholine or vagus stimulation, and counteract those of adrenaline. T. B. H.

Complete auriculo-ventricular block and auricular flutter. Effect of quinidine sulphate. L. F. JOURDONAIS and H. O. MOSENTHAL (Amer. Heart J., 1937, 14, 735—743).—A case of spontaneous auriculo-ventricular (A.V.) block with auricular flutter is reported. Quinidine restored a normal auricular rate, with complete A.V. block; there was a temporary stage of sinus rhythm with prolonged P-R interval in the electrocardiogram, when the auricular rate was 48. This suggests that there were still some functionally active fibres in the bundle of His.

C. A. K.

Action of saponin on the frog's heart. F. GOTTDENKER and C. J. ROTHBERGER (Arch. exp. Path. Pharm., 1937, 186, 185—194).—The various stages are described in the process of poisoning of the isolated frog heart by perfused saponin solutions. T. B. H.

Action of suprifen on the circulation. A. STURM and F. STÜCKMANN (Arch. exp. Path. Pharm., 1937, 186, 287—293).—Suprifen (*p*-hydroxyephedrine), which is intermediate in structure between ephedrine and adrenaline, is quick in action and only very slightly toxic. Clinically it leads to a 15 mm. rise of blood-pressure, lasting 1—2 hr. There is no vaso-constriction, the action being entirely on the heart; it is useless in surgical shock and contraindicated in heart disease. T. B. H. Action of theophylline with ethylenediamine. J. A. GREENE, W. D. PAUL, and A. E. FELLER (J. Amer. Med. Assoc., 1937, 109, 1712—1714).— Intravenous theophylline with ethylenediamine was administered to normal subjects, cases of hypertension and arteriosclerosis with and without cardiac failure, intracranial lesions, bronchial asthma associated with chronic pulmonary disease, and asthma of an allergic nature. Lowering of venous and intrathecal pressure occurred in all cases and coincided with relief of dyspncea, and restoration of regular breathing in those suffering from cardiac failure or Cheyne– Stokes respiration. Symptomatic relief occurred in all cases of asthma, with an increase in vital capacity in 9 of 11 instances. R. L. N.

Water-soluble theophylline compound. F. R. GREENBAUM (Amer. J. Pharm., 1937, 109, 550— 554).—Mono- and di-piperazine theophylline are water-sol. salts, but the solutions are unstable and on keeping form toxic products. Theophyllineisopropanolamine ("theopropanol") is quite stable. The $p_{\rm H}$ of the aq. solution is 9·2. Intracutaneous injection of 0·1 c.c. containing 18% of the purine base into a rabbit caused slight necrosis. Intramuscular injection of 1 c.c. caused slight infiltration, with rise of temp., whilst intravenous injection of 7 c.c. is below the max. tolerated dose. The compound has no diuretic action on the rabbit. The hæmolytic action slightly exceeds that of theophyllineethylenediamine (" aminophyllin"). J. N. A.

Thiocyanate therapy in hypertension. Micromethod for determining blood-thiocyanates. J. Q. GRIFFITH, M. A. LINDAUER, and R. CAMPBELL (Amer. Heart J., 1937, 14, 710—716).—Ten out of 16 hypertensive patients adequately treated and controlled showed improvement in response to oral KCNS administration. There was a lowering of blood pressure to less than 170 mm. Hg (systolic) and symptoms were relieved. A blood level of 10 mg. of KCNS per 100 c.c. was maintained, and no toxic signs were observed. A micro-modification of Barker's blood-KCNS method is described. This avoids the necessity for repeated venipuncture. C. A. K.

Results from trichloroethylene inhalations in the anginal syndrome of coronary sclerosis. F. A. WILLINS and T. J. DRY (Amer. Heart J., 1937, 14, 659—668).—40 patients with anginal syndrome were given trichloroethylene inhalations. Results were disappointing, but the drug is safe and well tolerated. C. A. K.

Diuretic action of juniper berries, Levisticum and liquorice roots, and Viola tricolor leaves in rabbits and mice. H. VOLLMER and R. WEIDLICH (Arch. exp. Path. Pharm., 1937, 186, 574—583).— The diuretic action of extracts obtained from the sources enumerated was examined. Increase of urine vol. and of urinary C is not found in any case to be parallel, and the effect on the two types of animal is in no case the same. T. B. H.

Diuretic action of Ononis spinosa, L., and Equisetum arvense, L. H. VOLLMER and H. HINDEMITH (Arch. exp. Path. Pharm., 1937, 186, 565-573).—The leaves of *E. arvense* cause in mice an increase of urine and of urinary Cl; in rabbits there was only an increase of Cl, and this only provided there is adequate Cl in the diet. Decoctions of the root *O. spinosa* cause an increase both of urine and of urinary chlorides in both animals.

T. B. H.

Effect of pituitrin on the action of diuretics. K. UNNA and L. WALTERSKIRCHEN (Arch. exp. Path. Pharm., 1937, **186**, 539—548).—Diuresis due to urea or K acetate is maintained under pituitrin, together with an increased Cl excretion which is not otherwise seen. Theopylline diuresis, which does not involve increased excretion of Cl', is intensified by pituitrin. T. B. H.

Diuretic action of birch leaves on rabbits and mice. H. VOLLMER (Arch. exp. Path. Pharm., 1937, 186, 584—591).—The increase of urine and urinary Cl is considerable in both animals, but greater in mice. An order of potency of this and of other drugs investigated previously is given for rabbits and mice, and differs considerably, both as regards urine vol. and Cl excretion. T. B. H.

Diuretic action of juniper berries, Levisticum and Ononis roots, birch leaves, liquorice root, and Equisetum on rats. H. VOLLMER and K. HUBNER (Arch. exp. Path. Pharm., 1937, 186, 592— 605).—An order of potency is drawn up for several diuretics on rats, both for urine vol. and for excretion of Cl. The orders are different, and differ from those obtained with rabbits and with mice. T. B. H.

Effect of parenteral administration of acetylcholine on inactivated muscles, joints, and bones. F. NEUBURGER and R. SCHOLL (Arch. exp. Path. Pharm., 1937, 186, 492–497).—Subcutaneous injection of acetylcholine prevents the development of ankylosis and muscular atrophy which normally results from fixation of a rabbit's limb in plaster for 4 weeks. T. B. H.

Effect of parenteral administration of acetylcholine on inactivated muscles, joints, and bones. II. F. NEUBURGER and R. SCHOLL (Arch. exp. Path. Pharm., 1937, **188**, 64—67; see preceding abstract).— 0.0037 g. of acetylcholine per kg. subcutaneously is the minimal effective dose. The effect is slightly enhanced by prostigmine; it is not abolished by small doses of atropine (0.06 mg. per kg.).

H. O. S.

Action on the carotid sinus of some choline derivatives. E. PHILIPPOT (Arch. int. Pharmacodyn., 1937, 57, 357—368).—Certain derivatives of choline, e.g., carbamylcholine, acetylcholine, ethyl and butyl ethers, acetyl- β -homocholine, stimulate the carotid sinus of the chloralosed dog; some have a slight effect and others none. Substances with pronounced nicotinic action are the most effective. D. T. B.

Dissociation of effects of acetylcholine and adrenaline in the midbrain animal. M. BON-VALLET and B. MINZ (Comp. rend. Soc. Biol., 1937, 126, 1109—1112).—Adrenaline and acetylcholine have a similar action on the spinal cord in the midbrain animal but not after atropine and ergotamine. D. T. B. Antagonism between atropine and pilocarpine or eserine in the silkworm. A. FOIS (Boll. Soc. ital. Biol. sperim., 1937, 12, 695—696).—The emetic and gastro-stimulatory actions of pilocarpine and eserine in silkworms are inhibited (more readily with pilocarpine) by atropine. The amounts of atropine necessary for antagonism of the emetic and gastric actions differ greatly, especially with pilocarpine.

F. O. H.

Thresholds of atropine, pilocarpine, and eserine actions in silkworms. A. FoIs (Boll. Soc. ital. Biol. sperim., 1937, 12, 697–698).— Equiv. doses to produce equal emetic and gastrostimulatory action in silkworms are $2.5 \ \mu g$. of eserine and 50 $\ \mu g$. of pilocarpine; one tenth of these doses have an equal gastro-stimulatory but unequal emetic actions whilst $0.5 \ \mu g$. of pilocarpine and $0.0002 \ \mu g$. of eserine are without action. Min. dosage of atropine to produce any apparent pharmacological action is $0.5 \ \mu g$. F. O. H.

Biological determination of small quantities of atropine. J. LÉVY and E. MICHEL (Compt. rend. Soc. Biol., 1938, **127**, 12–16).—A method is described depending on the quant. antagonism between acetylcholine and atropine on the isolated rat's duodenum. H. G. R.

Absorption and elimination of the tropeines. Z. DIRNER (Arch. exp. Path. Pharm., 1937, 186, 409—427).—The eye of the white rat is very sensitive to mydriatics, and well suited for testing for them. The properties of the tropeines are partly due to the tertiary or quaternary character of the tropine ring, and partly to their side-chains; the quaternary compounds are the more rapidly absorbed, the mandelic acid esters being more rapid in their action. Rabbit serum which is capable of splitting atropine and homatropine has no action on the quaternary bases. Atropine given by the mouth to a dog with a gastric fistula diminishes gastric secretion prior to any effect on either pulse or pupil. Atropine in this respect is 10 times as active as novatropine.

T. B. H.

Effects of nicotine on the pituitary. L. H. STRAUSS and P. SCHEER (Z. ges. exp. Med., 1937, **102**, 102—120).—No vasopressin could be demonstrated in blood or cerebrospinal fluid of man and dogs following poisoning with nicotine. A. S.

Pharmacology of hordenine. H. G. RIESTCHEL (Arch. exp. Path. Pharm., 1937, **186**, 387–408).— Hordenine, which is intermediate in structure between adrenaline and ephedrine, exhibits all the actions of adrenaline, stimulating the heart and powerfully constricting the vessels and relaxing the constricted bronchioles. On the intestine and uterus small doses cause relaxation but larger doses increase of tone. On the respiratory centre it antagonises the paralytic action of morphine. T. B. H.

Pharmacology of hordenine. H. G. RIETSCHEL (Klin. Woch., 1937, 16, 714—715; see preceding abstract).—In dynamic heart-lung preps. the rate and sometimes the stroke vol. are increased. In hearts rendered hypodynamic by histamine or pernocton, hordenine restores the normal stroke vol. for a period of about 20 min. by a direct action on the cardiac muscle. The coronary flow is increased in the heart *in situ*. Collapse induced in cats by evipan, pernocton, or avertin is counteracted. There is a strong antispasmodic action on bronchi.

F. W. L.

Effects of certain sympatholytic agents on hypertension and apnœa caused by sympathomimetics. E. LUNZ and R. BONNYNS (Arch. int. Pharmacodyn., 1938, 58, 109—128).—The synthetic sympatholytics F 883 and F 933 reverse the hypertensive action of adrenalone, epinine, and other sympathomimetics in the dog. They diminish the action of tyramine, hordenine, and ephedrine and prevent the usual apnœa. F 928 reverses the action of epinine and corbasil, but not the hypertension due to noradrenaline. F 940 has little influence on the hypertension due to tyramine, hordenine, or noradrenaline. D. T. B.

Human autonomic pharmacology. A. MYER-SON (J. Amer. Med. Assoc., 1938, **110**, 101–103).— A summary of the pharmacological effects of mecholyl, benzedrine, prostigmine, and atropine on the autonomic nervous system. R. L. N.

Pharmacological study of toad's ovarial poison. III—IX. T. MINESHITA (J. Oriental Med., 1937, 27, 125—130).—A neutral substance, *bufovarin*, m.p. 145—146°, very sparingly sol. in water but sol. in most org. solvents, has been extracted from toads' ovaries and purified. It stimulates isolated heart and intestine, contracts all smooth muscle, and paralyses nerve in frog and rabbit. It has no action on toads. P. C. W.

Liberation of histamine and its rôle in the symptomatology of bee venom poisoning. W. FELDBERG and C. H. KELLAWAY (Austral. J. Exp. Biol., 1937, 15, 461-489).-Bee venom contains histamine as well as other constituents. The histamine causes a rapid contraction of the isolated jejunum of the guinea-pig, followed by slow prolonged contraction. After recovery there are characteristic alterations in reactivity to histamine. In the cat, large doses of venom, injected intravenously, lower systemic blood pressure, raise pulmonary artery pressure, and cause fluid loss from the circulation and sometimes heart failure. In the dog, intravenous injection of small doses of venom causes long lasting fall in systemic pressure and anhydræmia. The pressure in the pulmonary artery is unaltered but that in the portal vein is increased. The liver is engorged, the lymph flow increased, and the lymph from the thoracic duct contains blood. Subendocardial hæmorrhages occur, and the mucosa of the duodenum shows hæmorrhagic congestion. Bee venom causes a prolonged liberation of histamine from the perfused lungs of the guinea-pig and dog, and from the perfused liver of the dog; 40-75% of the histamine content of the organs is liberated by venom in a dose of 5-20 stings. Coagulable protein appears in the perfusate, and when the liver is perfused D. M. N. pigments are also liberated.

Histamine-histaminase relations. F. ADDARH (Arch. int. Pharmacodyn., 1937, 57, 342-348).-- Histaminase is an important protective agent against histamine but not the only one in the living mammal. D. T. B.

Pharmacology of melanophores in frogs (Rana temporaria) and the rôle of the pituitary. T.C.R. SHEN (Arch. int. Pharmacodyn., 1937, 57, 289-334).-In normal frogs F 933 darkens the skin intensely; the effect is absent in amputated limbs, after hypophysectomy or decapitation caudal to the pituitary. Total extract or vasopressor principle of the posterior pituitary injected together with F 933 in hypophysectomised frogs produces the darkening effect. Chloralosane expands the melanophores maximally in normal frogs but not after hypophysectomy. Similar results are obtained with nicotine and yohimbine. Yohimbine reverses the melanophore-contracting action of adrenaline. Ergotamine induces pallor in the dark normal frog. (Cf. A., 1938, III, 64.) D. T. B.

Standardisation of cardiazole. H. G. RIET-SCHEL (Arch. exp. Path. Pharm., 1937, 186, 549— 551).—Cardiazole is antagonised by pernocton; this affords a method of biological standardisation.

T. B. H.

Analeptic action of 2-cyclohexyl-3-ethyl-1:2:4triazole (T 156). B. BEHRENS, G. DINKLER, and E. WOENCKHAUS (Klin. Woch., 1937, 16, 944-947).-The survival doses (mg. per kg.) of T 156 were : Rana temporaria 200; mouse 6; rabbit 2.5 intravenous, 12 subcutaneous; lethal doses were: Rana 400; mouse 12; rabbit 5 intravenous, 25 subcutaneous. In the dog 10 mg. per kg. subcutaneously produced transitory severe convulsions with opisthotonos and deeper respirations. Smaller amounts caused salivation, vomiting, and increased reflexes. When convulsions did not occur the body temp. fell. The compound showed no peripheral F. W. L. actions.

Pharmacological action of triazole compounds. O. GESSNER, E. SCHULZE, and H. KIRCHNER (Arch. exp. Path. Pharm., 1937, **186**, 482–491).—The action of numerous triazole compounds was studied. They are all extremely toxic, and of no practical utility. T. B. H.

Pharmacology of methyl 1:2:2:5:5-pentamethylpyrroline-3-carboxylate methiodide. J. W. SUPNIEWSKI (Bull. Acad. Polonaise, Cl. Méd., 1937, 1—7).—The substance depresses the heart of the chloralosed cat, isolated frog's and rabbit's heart, and rabbit's intestinal strip; very small doses augment the rabbit's heart. Large doses have curare-like action on the intact frog. It is not parasympathomimetic. It is prepared from methyl 2:2:5:5-tetramethylpyrroline-3-carboxylate (A., 1899, i, 773) by way of the hydriodide, m.p. 238— 241° (decomp.), of the 1-methyl alcohol gives methyl 1:2:2:5:5 - pentamethylpyrroline - 3 - carboxylate methiodide, which becomes brown and decomposes at 237°. P. C. W.

Pharmacology of copper. II. Sodium copper pyrocatecholdisulphonate. B. CACCIAVILLANI (Boll. Soc. ital. Biol. sperim., 1937, 12, 643—645).— The toxicity of the above compound (in which Cu

is present in a complex cation) with, *e.g.*, a dose lethal to rabbits within 15 min., is annulled by simultaneous administration of 17 times the mol. equiv. of Na pyrocatecholdisulphonate. F. O. H.

Selective thallium moult in sheep. N. A. ILJIN (Nature, 1938, 141, 162).—By selection of dose of Tl acetate, it is possible to cause moulting of fine wool while leaving the coarse wool of sheep unaffected. C. A. K.

Case of supposed silicon poisoning in the swan. E. GRAY (Nature, 1938, 141, 163). C. A. K.

Toxicity of silicon. C. P. MCCORD, W. G. FREDERICK, and S. STOLZ (J. Lab. clin. Med., 1937, 23, 278—279).—After elemental Si had been given subcutaneously, intramuscularly, or intraperitoneally to guinea-pigs and albino rats no evidence of toxicity was detected, such as follows the administration of org. Si compounds. T. H. H.

Toxicity of fluorine compounds. C. A. KEMPF and V. E. NELSON (J. Lab. clin. Med., 1937, 22, 1123— 1137).—Oral administration of 0.45 to 4.52 mg. of NaF per kg. body-wt. caused no effect on total Ca, acid-sol. inorg. P, hæmoglobin, or coagulation time of blood of the dog. Radiographs showed no changes in bones of dogs receiving NaF. α -Fluoronaphthalene, CaSiF₆, and CuF₂ caused mottled enamel of teeth; *p*-difluorodiphenyl, *p*-fluorobenzoic acid, and fluorobenzene had no effect on teeth. Ingestion of Al₂(SO₄)₃ along with fluorides prevents or reduces the effect of F on teeth. T. H. H.

Possible rôle of glutathione as a detoxifying agent. B. HARROW, I. M. CHAMELIN, and A. MAZUR (Proc. Soc. Exp. Biol., 1937, 37, 271-273).—Na benzoate which combines in the body with glycine, and bromobenzene which combines with cysteine, were injected subcutaneously into rabbits. Provided the rabbits had been starved for 24 hr. previously, the benzoate injection caused an increase in the glutathione of the blood of about 20% and the bromobenzene an increase of about 9%. V. J. W.

Glycerol toxicity and hæmoglobinuria in relation to vitamin-C. C. PFEIFFER and I. ARNOVE (Proc. Soc. Exp. Biol. Med., 1937, 37, 467-469).— Administration of 500 mg. per kg. of ascorbic acid to rats raised the parenteral dose of glycerol necessary to cause hæmoglobinuria by 100% or more.

V. J. W.

Selective antidotal action of hydrogen sulphide and sulphides against mercurial poisoning. I. SIMON (Boll. Soc. ital Biol. sperim., 1937, 12, 661).— Administration of 3 c.c. of 0.1N-Na₂S per kg. body-wt. into rabbits prevents the lethal action of 3 c.c. of 0.1N-HgCl₂ per kg. when administered within 30 min. but fails after 60 min. F. O. H.

Failure of sodium bicarbonate as an antidote for mercury. I. SIMON and G. CIAMPOLINI (Boll. Soc. ital. Biol. sperim., 1937, 12, 659-660).— Intravenous administration of aq. NaHCO₃ has no effect on the toxicity of orally or intravenously administered aq. HgCl₂ in rabbits. F. O. H.

Failure of glucose as an antidote for mercury. I. SIMON and M. SAVARESE (Boll. Soc. ital. Biol. sperim., 1937, 12, 658—659).—Administration of min. lethal doses of HgCl_2 with glucose by various routes to rabbits indicates that glucose cannot be considered as antidotal to Hg poisoning, the excretion of Hg not being increased. F. O. H.

Absorption of drugs and poisons through the skin and mucous membranes. D. I. MACHT (Arch. int. Pharmacodyn., 1938, 58, 1—26).—Fixed oils and fats do not facilitate cutaneous absorption of drugs. Many essential oils and their constituents are easily absorbed and are suitable vehicles for drugs. Nicotine is rapidly absorbed through skin or mucous membrane. D. T. B.

Action of drugs in small amounts on musclediastase. W. M. PERSSON (Arch. int. Pharmacodyn., 1938, 58, 93—102).—Strychnine (1×10^{-3}) inhibits the diastasic activity of frog's skeletal muscle. Thyroxine and insulin have no effect. On heartmuscle strophanthin and P were slightly active, caffeine and nitroglycerin more so. Digitalis, strychnine, and adrenaline have no effect.

D. T. B.

Use of methylene-blue in cyanide poisoning. A. STURM and K. PANZER (Arch. exp. Path. Pharm., 1937, 186, 303—305).—Chromosmon (methyleneblue) given to rabbits intraperitoneally or intravenously acts as a sp. antidote to KCN poisoning, if administered either just before the poison or 1—2 min. later. T. B. H.

Mucous membrane hypersensitiveness. II. Passive local sensitisation of the nasal mucous membrane. H. SHERMAN, C. KAPLAN, and M. WALZER (J. Allergy, 1937, 9, 1-6).-26 of 31 subjects who previously had shown no pollen-sensitivity were successfully locally passively sensitised in the mucous membrane of the inferior turbinate and septum on one side, by local injection of reagin-bearing serum obtained from patients who reacted markedly to intracutaneous injection of ragweed extract containing 0.0001 to 0.001 mg. of N per c.c. The other side served as a control. Reactions in the form of œdema without other subjective symptoms were elicited at the sensitised sites by intravenous, subcutaneous, and intramucosal injections and by topical application of the antigen, in that order of effectiveness. The local sensitiveness lasted several weeks and could be exhausted by repeated tests with the sp. antigen.

C. J. Č. B.

Association with pseudoglobulin of the skin-sensitising substance of allergic (hay fever) serum. A. STULL, W. B. SHERMAN, and R. A. COOKE (J. Allergy, 1937, 9, 7-13).-Serum was taken from 3 patients sensitive to ragweed pollen before and after treatment with pollen extract, and the albumin, euglobulin, and pseudoglobulin were separated. Whole serum and the purified serumproteins, in varying dilutions, taken before treatment, were injected intradermally into non-sensitive test subjects and these sites tested 48 hr. later with ragweed extract. Neither albumin nor euglobulin transferred the skin reaction, while whole serum and pseudoglobulin did. Further sensitising capacity tests and tests for neutralisation by ragweed extracts showed that the pseudoglobulin and whole serum

taken after treatment reacted in greater dilutions and required more extract for neutralisation than when taken before treatment. As there was no significant quant. change in the pseudoglobulin, it was concluded that there was a qual. alteration after treatment. All serum and pseudoglobulin tests ran parallel, indicating that the pseudoglobulin contained all the active material. C. J. C. B.

Immunity in a type of human allergy (hay fever). II. Serological response of non-sensitive individuals to pollen injections. R. A. COOKE, M. LOVELESS, and A. STULL (J. Exp. Med., 1937, 66, 689—696).—In human subjects, nonsensitive to ragweed pollen, there is absence of correlation between serological changes and sp. skin reaction. The former, demonstrated by inhibition of immediate skin reaction and interference with neutralisation of sensitive serum by its antigen, are associated with serum-pseudoglobulin. A. C. F.

Anaphylaxis in multiply sensitive guinea-pigs. H. N. PRATT (J. Allergy, 1937, 9, 14-22).-73 guinea-pigs were sensitised to egg-albumin and to horse serum-globulin in equal amount. 28 days later they were tested in three groups for degree of sensitivity by intravenous injection of (1) eggalbumin, (2) horse-globulin, (3) both antigens to-gether. The two antigens given together did not enhance the degree of anaphylactic shock compared with one antigen, but doubling the shock dose of either antigen alone resulted in increased response. Possibly the body can react to only one antigen at a time during the short period that an anaphylactic reaction takes place, or the egg-albumin mol. being much smaller than that of horse serum-globulin leaves the vascular bed and reaches the sensitised cells more quickly, and the cell reacts only to the first sp. excitant with which it comes in contact.

C. J. C. B.

Therapeutic value of iodised oil in bronchial asthma. L. H. CRIEP and J. W. HAMPSEY (J. Allergy, 1937, 9, 23-36).—40 asthmatic patients were treated by iodised oil : 20 by intratracheal insufflation, 10 by bronchoscopic introduction of the oil in the authors' clinic and 10 treated elsewhere. In the intratracheal group, only 3 obtained relief, in the bronchoscopic group only 1, and in the third group none obtained relief. From a questionnaire answered by 64 members of 2 societies for the study of allergy, it was found (1) in bronchial asthma (267 cases) cure by iodised oil 1.9%, improvement 24.7%; (2) in asthmatic bronchitis (39 cases) cure 0.8%, improvement 22.8%. Reactions in the form of severe iodism, pneumonia, allergic reactions, and death were not rare. C. J. C. B.

Sensitivity to house dust and goose feathers in infantile eczema. Rôle of specific allergens. L. W. HILL (J. Allergy, 1937, 9, 37—47).—A large proportion of infants under 1 year with atopic dermatitis gave sp. reactions to intradermal house dust and goose feathers, much less by the scratch method, and none in normal infants. In some severe cases, removal of all sp. allergens was ineffective, possibly due to the effect of house dust or other environmental allergens or even autogenous allergens. C. J. C. B.

Blood surface tension, sedimentation rate, and hypertensive blood pressure responses following the ingestion of allergenic foods. C. J. SULLIVAN and W. T. VAUGHAN (J. Allergy, 1937, 9, 48—53).— 85 patients were classified as "positive" allergics if they showed a positive leucopenic index, "strongly positive" with a history, skin test, and marked leucopenic index, and "negative," and these three groups were given allergenic foods. The surface tension of citrated blood fell to an abnormally low level in allergics but not low enough to be used as a clinical test. There was no definite change in the sedimentation rate. Some allergics showed a slightly abnormal increase in the systolic blood pressure following ingestion of their sp. foods but there was no relation in the two allergic groups. C. J. C. B.

Scorings in the long bones as a guide in management of food allergy in children. M. B. COHEN and S. FRIEDMAR (J. Allergy, 1937, 9, 54— 59).—In 610 patients aged $2\frac{1}{2}$ —16 with clinical signs of allergy, there were scorings in the long bones in 59·2%; in 195 clinically negative children 36.9%showed scorings. Scorings were found in almost every food allergic child under 6 years of age, but seldom in pure respiratory allergy. When no scorings are present, food allergies are excluded; if scorings are present the diet should be investigated and limited until no new scorings appear.

C. J. C. B.

Critical review of recent literature on physical allergy, intrauterine sensitisation, mechanism of specific treatment in hay fever, and hypersensitiveness in monkeys. M. WALZER (J. Allergy, 1937, 9, 64—84). C. J. C. B.

Mucous membrane hypersensitiveness. III. Allergic reaction of the passively sensitised rectal mucous membrane. I. GRAY and M. WALZER (Amer. J. digest. Dis. Nutr., 1938, 4, 707-712).—In 44 patients the rectal mucous membrane was passively and locally sensitised by injections beneath it of human serum containing marked reagin antibodies for peanut. Control injections of reagin were also made into the skin of the forearm. When, 24 or 48 hr. later, ground peanuts were given by mouth or rectally, there followed a local allergic reaction consisting of œdema, hyperæmia, and increased mucous secretion with pruritus, burning, sense of fullness, and desire to empty the bowel. With rectal administration there was a slight local effect followed later by reaction at the site of the control skin inoculation; with the appearance of this skin reaction the rectal reaction was intensified, suggesting that the absorbed protein is an important factor.

C. J. C. B.

Influence of mixtures of hormones on the anaphylactic reaction of actively sensitised animals. F. E. HAAG, H. KÖNIG, K. HUMMELSIEP, G. RÖBER, and A. CRAMER (Z. Immunitätsforsch., 1937, 91, 419-445).—Mixtures of adrenaline with posterior or anterior pituitary hormones and parathyroid hormone show an action differing from that of the separate hormones when injected into sensitised rabbits. C. R. S.

Effect of vitamin content of the food on anaphylactic shock in guinea-pigs. W. SCHÄFER (Z. Immunitätsforsch., 1937, 91, 385–393).—The animals were sensitised with horse-serum (1:100) intraperitoneally, followed by subcutaneous injection of 1:100 serum after 6 days. After 21 days an intravenous injection was given. Animals maintained on a vitamin-poor diet during the sensitisation period did not show altered sensitivity in the allergic reaction as compared with animals maintained on a vitamin-Animals on a vitamin-rich diet rich diet. further supplemented by ascorbic acid showed a slightly greater sensitivity than the controls; animals on the same vitamin-rich diet further supplemented by vitamin-D showed a slightly smaller mortality. B. C. J. G. K.

Does ascorbic acid protect against anaphylactic shock in guinea-pigs? W. SCHÄFER (Z. Immunitätsforsch., 1937, 91, 394–404).—Ascorbic acid, dehydroascorbic acid, cysteine, and cystine did not lower the mortality figures for anaphylactic shock in guinea-pigs, when administered intraperitoneally and /or intravenously in quantities of 50–100 mg. in the hr. before re-injection with serum. B.C.J.G.K.

Pollen and hay-fever. D. H. CAMPBELL (Science, 1938, 87, 16).—The irritation of the nasal mucous membrane in hay-fever may be caused by rapid germination of pollen spores, and enzyme excretion during the penetration of the pollen tube into the tissues of the host. C. A. K.

Influence of kephalin on the allergic inflammation. K. PELCZAR, I. SAMBORSKI, and M. DE BREZA (Z. ges. exp. Med., 1937, 102, 185—191).— Subcutaneous injections of kephalin into rabbits sensitised with horse serum inhibit the Arthus phenomenon and hyperergic reactions; necrotic tissue heals more rapidly. A. S.

Rôle of autonomic nervous system in dichlorethyl sulphide poisoning. P. GASTINEL and R. SOHTER (Compt. rend. Soc. Biol., 1938, 127, 46— 49).—Dichloroethyl sulphide applied to the splanchnic nerve in guinea-pigs and rabbits is fatal in doses which do not kill subcutaneously; pulmonary and other lesions produced are due to effects on the autonomic system. D. T. B.

Codeine in indian opium. H. B. DUNNICLIFF (Nature, 1938, 141, 207).—A correction of a previous statement (cf. A., 1937, III, 350). Indian opium contains 1-2% of codeine and not 2-4%.

Comparison between the methods for determining differences in the activity of morphine salts. J. RÉGNIER and S. LAMBIN (Compt. rend. Soc. Biol., 1938, 127, 116—118).—The activity of a particular salt, measured by different methods, is modified by its speed of entry into and elimination from the cells. H. G. R.

Effect of different salts of morphine, injected intravenously in solution into the rabbit, on the depression of the oculo-palpebral reflex. J. RÉGNIER and S. LAMBIN (Compt. rend. Soc. Biol.,

C. A. K.

1938, **127**, 113—116).—The hydrochloride is less active than the citrate and slightly more active than the phenylpropionate. H. G. R.

Action of various members of the morphine series and emetine on the choline-esterase of the brain. H. H. KUHN and D. SURLES (Arch. int. Pharmacodyn., 1938, 58, 88—92).—Inhibition of cerebral choline-esterase by the morphine series depends on the dose, is less at $p_{\rm H}$ 6.7 than 7.8, and is independent of duration of preliminary incubation of drug with enzyme. The greater is the central emetic action of the drug the greater is the inhibition. D. T. B.

Attempt to measure the action of morphine on oculo-palpebral reflex. J. RÉGNIER and S. LAMBIN (Compt. rend. Soc. Biol., 1938, 127, 39—42).— Morphine given intravenously or subcutaneously, depresses the oculo-palpebral reflex in rabbits. Instillation of the drug into the eye produced no effect. D. T. B.

Effect of season on habituation to morphine. G. MATSCHULAN (Arch. exp. Path. Pharm., 1937, 186, 113—117).—Guinea-pigs are more quickly habituated to morphine and more slowly released from the habit in spring than in autumn. This is attributed to differences in autonomic excitability. T. B. H.

Physiological action of gelsemine. RAYMOND-HAMET (Compt. rend., 1937, 205, 1449—1451).— Gelsemine (0.2 mg. intravenously) produces a prolonged fall of blood pressure in the dog, and increases respiration; 8 mg. increases the hypertensive action of adrenaline and nearly abolishes the apnœa due to the latter. J. L. D.

"Gas-oxygen" and cerebral congestion. H. J. BRENNAN (Lancet, 1938, 234, 315–319).— $N_2O + O_2$ is the best anæsthetic for intracranial surgery, provided that cerebral congestion is avoided.

C. A. K.

cycloPropane anæsthesia, with reports of 732 administrations. R. F. BONHAM (Current Res. Anæthesia and Analgesia, 1937, 16, 341—345).— Inhalation of cyclopropane produces unconsciousness in from 20 sec. to 3 min. There were no fatalities. Using a closed-circuit method, anæsthesia is induced by administration of 500 c.c. each of cyclopropane and O_2 per min. for 3—5 min. The average maintenance mixture is 15% cyclopropane to 85% O_2 . Signs of overdosage are arhythmia, slowing of the pulse below 50 per min., or tachycardia. cyclo-Propane is not a respiratory stimulant. F. B. P.

Effect of anæsthetics on the vitamin-C content of various organs. H. I. LAUBER, H. DUMKE, and A. PATZSCHKE (Z. ges. exp. Med., 1937, 102, 1—7).— Vitamin-C was determined histologically in guineapigs and rabbits by the method of Giroud and Leblond. Various anæsthetics (ether, chloroform, ethyl chloride, avertin, and evipan) diminish the -C content of the adrenal cortex, liver, and kidney; more -C was found in the ovaries. A. S.

Factors influencing pentothal anæsthesia. S. N. BLACKBERG and C. HRUBETZ (J. Lab. clin. Med., 1937, 22, 1224—1227).—Fasting for 24 hr. increased the susceptibility of rabbits to pentothal, and lengthened the duration of anæsthesia. No correlation was found between the blood-sugar level and susceptibility to the drug. T. H. H.

Use of anæsthetics on victims of poison gas. W. HECKSTEDEN (Arch. exp. Path. Pharm., 1937, 186, 451—461).—Evipan Na was administered intravenously to cats and rabbits poisoned with "Perstoff." The anæsthesia was normal and the mortality from poison gas unaffected. T. B. H.

Mutual relations of sensitiveness to chloroform, avertin, and eunarkon. O. EICHLER and A. SMIATEK (Arch. exp. Path. Pharm., 1937, 186, 702— 720).—The sensitivity of rats to general anæsthetics was determined statistically on many animals, and small effects were thereby revealed which a single experiment might fail to show. Sensitivity to chloroform is lowered by a previous administration, even after a 3—4 weeks' interval; and the same is true, though less evident, with avertin. The effect of previous avertin on sensitivity to chloroform, or vice versa, is definite but still smaller. Eunarkon, which acts on the brainstem, has no influence on the sensitivity to avertin or chloroform, which act on the cortex. T. B. H.

N-Aryl-*N*'-dialkylaminoalkylcarbamides as local anæsthetics.—See A., II, 92.

Sympathomimetically active local anæsthetics. —See A., II, 98.

Effect of cocaine on inactivation of adrenaline by acetaldehyde. G. BAYER and T. WENSE (Arch. exp. Path. Pharm., 1937, 188, 114–120).—The inactivation of adrenaline *in vitro* by acetaldehyde is inhibited by O_2 lack and by cocaine. H. O. S.

Diminution of cocaine anæsthesia by oxalic acid. J. SMILGA (Arch. exp. Path. Pharm., 1937, 186, 118—120).—The anæsthetic action of cocaine is diminished in chronic oxalic acid poisoning owing to diminution of blood-Ca. T. B. H.

Physical and biological properties of local anæsthetics. O. GESSNER, M. WALTHER, and K. REINHARDT (Arch. exp. Path. Pharm., 1937, 186, 329—336).—15 local anæsthetics are compared for toxicity, hæmolytic activity and lipoid-solubility; no parallel could be drawn between their respective activities in these ways. T. B. H.

Chronic effects of phanodorm and noctal. A. KRAUTWALD (Arch. exp. Path. Pharm., 1937, 186, 513—531).—Phanodorm administered daily to dogs very quickly leads to habituation. If the dose is gradually increased by 50%, however, sleep is still obtained. There are no abstinence phenomena. The excretion rate continues the same during the whole period of administration. Noctal leads very quickly to habituation and no hypnotic effect can be obtained after the first few days. T. B. H.

Chronic effects of veronal and luminal. A. KRAUTWALD and H. OETTEL (Arch. exp. Path. Pharm., 1937, 186, 498—512).—Daily administration of veronal (100 mg. per kg.) over long periods to dogs leads to only slight habituation, and an increase of dose causes deep coma. The rate of excretion rises with use, 67% being excreted unchanged. There are no symptoms on withdrawal. Luminal, on the other hand (30 mg. per kg.), soon leads to habituation and no longer provokes sleep, but only cerebral disturbance. In spite of this habituation the excretion remains const., 20-25% of the dose appearing in the urine unchanged. T. B. H.

Action of substituted products of acetamide. K. JUNKMANN (Arch. exp. Path. Pharm., 1937, 186, 552—564).—The hypnotic action of acetamide on rabbits is increased by substitution, especially if this is threefold, with short-chain, unsaturated radicals. The spasmolytic action of substitution products, on the contrary, is shown best by saturated groups with as many as 12—17 C atoms. Tri-*n*-butylacetamide is among the best, and is non-toxic.

T. B. H.

Acute poisoning from a new motor fuel (liquefied propane). J. WOLF and F. MENNE (Arch. exp. Path. Pharm., 1937, 186, 78—88).—The symptoms were central nervous excitation and of stimulation of parasympathetic nerves. When administered to anæsthetised rabbits the gas produced a marked slowing of the pulse and fall of blood pressure, abolished by atropine or section of the vagi. The symptoms are attributed to olefine contained in the gas, the actions of which therefore are rather inconst.

T. B. H.

Use of methylene-blue with glucose in carbon monoxide poisoning. A. STURM and H. WOHL-FARTH (Arch. exp. Path. Pharm., 1937, 186, 294— 302).—Chromosmon (a 1% solution of methyleneblue in 10% glucose) has no sp. benefit in counteracting CO poisoning in rabbits. The slightly favourable action is shown equally well by plain solutions of glucose. T. B. H.

Gastric ulceration produced in rats by oral and subcutaneous aspirin. H. G. BARBOUR and V. C. DICKERSON (Arch. int. Pharmacodyn., 1938, 58, 78—87).—Gastric ulceration was produced in 66 out of 69 rats by the oral administration of aspirin in daily dosage of 300 mg. per kg. for 10 days. Dilution and the addition of NaHCO₃ diminished the severity of the ulceration, but Ca gluconate, CaCO₃, and MgO were without beneficial effect. There is some seasonal variation in aspirin ulcers. Aspirin subcutaneously also caused gastric ulceration and, in large doses, severe gastric hæmorrhage. The mechanism of parenteral aspirin ulceration is not known.

D. T. B.

Additive product of antipyrine and β -naphthol. A. RISI (Arch. exp. Path. Pharm., 1937, **186**, 195—205).—The crystallographic properties of the substance formed by condensing antipyrine with β -naphthol are described; it is insol. in water, sol. in org. solvents. Its actions are similar to those of antipyrine, but less strong; it is also less toxic. T. B. H.

Habituation to alcohol and its oxidation-rate. E. KEESER and H. A. OELKERS (Arch. exp. Path. Pharm., 1937, 186, 606-610).—The rate of disappearance of alcohol from the blood of rabbits after administration by the mouth remained unaltered after giving large doses daily for 3½ months; it was not increased by administration of elityran. The addition of elityran to slices of guinea-pig liver or kidney increased their respiration rate, but addition of alcohol did not. T. B. H.

Action of the vapour of ethereal oils. F. HAFFNER (Arch. exp. Path. Pharm., 1937, **186**, 621— 624).—The general effect on frogs and on mice of inhaling the vapour of 34 various ethereal oils is noted and tabulated. T. B. H.

Antagonistic, but not antidotal, action of sodium luminal against strychnine. I. SIMON (Boll. Soc. ital. Biol. sperim., 1937, 12, 662—664).— Subcutaneous injection of Na luminal (0.05 g. per kg. body-wt.) at varying periods up to 5 min. after the injection at the same site of a lethal dose (0.6 mg. per kg.) of strychnine has no effect on the survival period. Hence the observed mutual toxicity-decreasing action between Na luminal and strychnine is one of antagonism and not antidotism. F. O. H.

Corn whisky and strychnine poisoning. J. C. NORRIS (Amer. J. clin. Path., 1937, 7, 531-535).-Dogs were given 30-50 c.c. of sweetened corn whisky, followed 5 min. later by 25 mg. of strychnine nitrate or sulphate, or the strychnine followed by the whisky or both given together. All dogs died in 30-60 min. Whisky and strychnine are not antidotal (as Gold and Travell stated) but in combination are lethal poisons. C. J. C. B.

Seat of fatigue in strychnine poisoning. E. SCHILL (Arch. exp. Path. Pharm., 1937, 186, 206— 211).—The seat of fatigue in the strychninised frog is in the collaterals of the sensory neurones, since the effect of repeated stimulation at a fixed point becomes progressively less widespread. T. B. H.

Peptic ulcer therapy. M. B. LEVIN (Amer. J. digest. Dis. Nutr., 1937, 4, 574–576).—The treatment is described of 30 cases of peptic ulcer with antacid adsorbent powder which was a mixture of $(NH_4)_2HPO_4$, NaHCO₃, CaCO₃, and hydrated Mg trisilicate. C. J. C. B.

Antihormone complement-binding substances after treatment with phenol. M. TAUBENHAUS and F. MEDAK (Arch. int. Pharmocodyn., 1937, 57, 284—288).—After intravenous injection of phenol in rabbits a positive complement-binding reaction is observed with phenol and dityrin as antigens. The antibody resembles that produced by hormones.

D. T. B.

Properties of dinitrocresol. J. MOLNAR (Ann. Physiol. Physicochim. biol., 1937, 13, 1164—1178).— Ultra-violet spectral analysis reveals two varieties of dinitro-o-cresol, one of m.p. 105° with a band at λ 360 mµ. and the other of m.p. 85.5° with band at λ 380 mµ. The latter is 3 times as toxic and as active as the other (m.l.d. 30 and 90 mg. per kg. compared with 60 for 2 : 4-dinitrophenol). D. T. B.

Excretion and cumulation of *purpurea* glucoside A. R. GARAN (Arch. exp. Path. Pharm., 1937, 186, 444—448).—The cumulation and excretion of the genuine *purpurea* glucoside A are studied by various methods and found to conform to those of digitoxin and digilanid A. T. B. H. Action of ammonia and ammonium chlorate on the skin. J. FLIEDERBAUM and R. TISLOWITZ (Arch. exp. Path. Pharm., 1937, **186**, 212–217).— The wheal formed in the ear of a rabbit by injection of saline under the skin persists longer if NH_3 has been added to the saline, and less long if NH_4ClO_3 has been added. T. B. H.

(r) INDUSTRIAL PHYSIOLOGY AND HYGIENE.

Practical application of physiology to hygiene in industry. G. P. CROWDEN (J. Roy. San. Inst., 1937, 58, 281–293).—The factors influencing the daily cycle such as activity, environment (temp. R.H., pressure, noise, lighting, dust, etc.), and duration and rate of working are discussed. W. L. D.

Bacterial contamination of the air of textile mills with special reference to the influence of artificial humidification. W. F. WELLS and E. C. RILEY (J. Ind. Hyg., 1937, 19, 513-561).-Textile mill atm. are contaminated by bacteria carried in dust particles raised by manipulation of materials and in "droplet nuclei" formed by evaporation of contaminated humidification water. The dust particles are larger than the droplet nuclei, and can be differentiated by their settling velocity. The ratio of vol. count to area count (nuclei index) is therefore an index of particle size and of droplet nuclei contamination. The index is larger in humidified than in non-humidified rooms, and increases in proportion to the moisture added. The reciprocal of the nuclei index represents the resultant falling velocity of particles, from which their equiv. diameter is determined: such determinations indicate that ²/₃ to 5 of the bacteria are introduced with the humidification water. This water was contaminated by the use of a polluted source, or by bacterial growth in the system; sewage organisms were identified in many systems. Experimentally a high R.H. greatly increased the rate of disappearance of B. coli from contaminated air. E. M. K.

Air currents and draughts as factors in air conditioning. D. L. MACLEAN and R. C. PARTRIDGE (J. Ind. Hyg., 1937, 19, 562-570).—The velocity at which air movement became uncomfortable was determined by directing air currents on to the exposed skin of the face, hands, and feet. The majority (70%)of subjects could detect air movement at 50-70 ft. per min., and found it uncomfortable above 350 ft. There was a direct linear relationship between the effective temp. at foot level (59-69°) and the skin temp. of the leg in the path of the air current. There was no significant correlation between air movement, or its effective temp., and blood pressure, oral temp., metabolic rate, or heart rate. Air currents directed on the face produced changes in the nasal mucosa; the effective velocity usually approximated to that at which the subject reported discomfort. E. M. K.

Detection of crystalline silica in lung tissue by X-ray diffraction analysis. R. KLAAS, H. C. SWEANY, J. N. MRGUDICH, and G. L. CLARK (Science, 1937, 86, 544—545).—The method described avoids destruction of org. matter and permits the detection of quartz in lung tissue containing as little as 0.26% SiO₂. L. S. T.

(s) RADIATIONS.

Comparative effects of neutrons and X-rays on the body. J. H. LAWRENCE and R. TENNANT (J. Exp. Med., 1937, 66, 667—688).—Irradiation of mice with neutron rays causes atrophy of lymphoid tissues, aplasia of bone marrow, and intestinal ulceration. Neutron rays are more potent than X-rays in producing these changes. A. C. F.

Detection of biological action of irradiated potassium salts by the Schultz-Dale method. S. WOLFRAM and O. REID (Klin. Woch., 1937, 16, 785—787).—The action was tested on the isolated virgin guinea-pig uterus. Adding 5 c.c. of 1% KCl to the bath of 80 c.c. produced no response or only a slight contraction; when similar amounts of irradiated KCl were applied, marked clonic or tonic contractions occurred. F. W. L.

Chronic X-ray and radium dermatitis. T. S. SAUNDERS and H. MONTGOMERY (J. Amer. Med. Assoc., 1938, **110**, 23—28).—An analysis of 259 cases of chronic radium or X-ray injuries to the skin showed that the majority of injuries were contracted through therapeutic exposure rather than occupationally. Epitheliomas of the squamous cell type developed in 27 of the cases, apparently with equal frequency from either keratoses or ulcerations. The histopathological picture and treatment of chronic radio dermatitis are discussed. R. L. N.

Influence of radium and radium emanation on normal and cancer cells. Tissue culture experiments. T. GORDONOFF and F. LUDWIG (Schweiz. med. Woch., 1938, 68, 45—47).—Plasma of chickens and rats containing Ra emanation inhibits the growth of cultures of normal fibroblasts and cancer tissue of mice. The inhibition by Ra emanation is reversible; the tissue cultures grow normally if suspended again in normal plasma.

A. S.

Reducing property of protein irradiated with ultra-violet light. I. KÄMMERLING (Arch. exp. Path. Pharm., 1937, 186, 434—443).—The reducing properties, associated with the formation of a SH compound, developed by protein under the influence of ultra-violet light (cf. Wels, A., 1933, 1063; Kather, A., 1937, III, 253) may be obtained with therapeutic doses of irradiation. The reducing action of the substance is intensified by illumination with red light. T. B. H.

Cutaneous histamine after ultra-violet irradiation. B. TARRAS-WAHLBERG (Klin. Woch., 1937, 16, 958—960).—In rabbits and cats the concn. of histamine in the skin after irradiation varies with that of the blood. F. W. L.

(t) PHYSICAL AND COLLOIDAL CHEMISTRY.

Form of fibrin micelles in solution. G. BOEHM (Biochem. Z., 1937, 294, 325—329; cf. A., 1936, 711; von Dungern, A., 1937, III, 296).—Fibrin sols exhibit positive streaming double refraction and contain rod-like micelles. W. McC. Behaviour of gelatin gels during electrolysis. J. SWYNGEDAUW (Compt. rend. Soc. Biol., 1937, 126, 1195—1197).—The development and distribution of zones of swelling and contraction in the gel during electrolysis are governed by the $p_{\rm H}$ and the saline impurities present. H. G. R.

Action of urethanes on the external and internal potentials of frog skin. W. DUCE (Arch. Fisiol., 1937, 37, 1—18).—Urethanes dissolved in Ringer's solution, when applied to the external surface of isolated frog skin, greatly depress the external and the total potential, but when applied to the internal surface they cause no definite electrical change. It is concluded that their action is not dependent on their diffusibility into the skin.

G. S.

Action of diethyl ketone on the e.m.f. of frog skin. W. DUCE (Arch. Fisiol., 1937, 37, 19-34).— Diethyl ketone dissolved in Ringer's solution applied to the internal surface of isolated frog skin causes no const. electrical change. When applied to the external surface it depresses the external and the total potential, and the effect is the greater the greater is its concn. The action is attributed to the surface activity of the ketone. G. S.

Action of eucolloids on the external and internal potential of frog skin. W. DUCE (Arch. Fisiol., 1937, 37, 35-44).-Dialysed serumalbumin, euglobulin, and ovalbumin, dissolved in Ringer's solution, have no const. effect when applied to the internal surface of frog skin. On the external surface, they cause a depression of the external and total potential, which is the greater, the greater is their concn. The results are considered to support Boell and Taylor's theory of a parallelism between the surface activity of a substance and its effectiveness in depressing the e.m.f. of frog skin. G. S.

Partition of porphyrins between ether and hydrochloric acid and its application to the separation of mixtures of porphyrins. K. ZEILE and B. RAU (Z. physiol. Chem., 1937, 250, 197—217). —Theoretical considerations of partition coeffs. of porphyrins between ether and aq. HCl are discussed and practical applications to the separation of various porphyrin mixtures (e.g., from faces) described.

F. O. H.

Action of alkali metals on collagen. I. A. SMORODINCEV and S. A. PAVLOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 17, 217–220).—Effects of maceration with NaCl and Na₂SO₄ on the coeff. D(A., 1937, III, 374) of collagen extracts confirm the theory of the progressive combination of neutral salts with active groups of proteins which is associated with the enolisation of the peptide groups. A. G. P.

Protein structure and water absorption.—See A., I, 139.

Movement of materials across living membranes.—See A., I, 136.

Outline of General Physiology. L. V. HEIL-BRUNN (W. B. Saunders Co., Philadelphia and London, 1937, 603 pp.).—This book is the most complete that has appeared in English on the subject since the well-known work by Bayliss. After a careful account of the chemical and physical properties of living cells, the author goes on to deal with their metabolic processes and then with the various forms of energy which they manifest, under the headings of movement, electricity, and light. The general effects of environment and the special effects known as tropisms and irritability lead on to the nature of conduction, and the book concludes with an account of reproduction and cell division. The author covers a vast ground with an astonishing completeness. There is a very complete index and the copious references are given in footnotes to the text instead of being massed together at the ends of the chapters. V. J. W.

(u) ENZYMES.

Origin of optical activity of natural substances. W. LANGENBECK (Chem.-Ztg., 1938, 62, 1-2).—A discussion with special reference to enzyme action. E. S. H.

Significance of ergones, enzymes, and accessory substances in cellulose metabolism. H. VON EULER (Ergebn. Vitamin- Hormonforsch., 1938, 1, 159—190). A. S.

Enzymic preparation from mucous membrane of stomach. N. S. DROZDOV and L. A. ASCHARINA (Ukrain. Biochem. J., 1937, 10, 715—718).—Repeated extractions from the mucous membrane of stomach (pig) yield a highly conc. prep. of enzyme. For max. activity, rapid desiccation at a low temp. is necessary. E. M. W.

Biological activation, transfer, and oxidation of hydrogen. T. THUNBERG (Ergebn. Physiol., 1937, 39, 76-116).—A review. W. McC.

Inhibition of dehydrogenases by tannin. W. SEITZ (Arch. exp. Path. Pharm., 1937, **188**, 68—78).— The inhibitory action of tannic acid on methyleneblue reduction in plant extracts cannot be due to inhibition of an enzyme, as is assumed by Thunberg, since methylene-blue is inhibited by simple org. compounds to the same extent, and not all H acceptors are inhibited, but only those with a relatively high redox potential. H. O. S.

Dehydrogenase systems of the Jensen sarcoma. H. VON EULER, P. SCHLENK, and N. FORSMAN (Naturwiss., 1938, 26, 11—12).—In presence of cozymase and lactoflavin, dialysed extracts of Jensen rat sarcoma oxidise lactic and malic acids rapidly but succinate, glucose, and fructose only very slowly or not at all. In presence of codehydrase II and lactoflavin, hexose mono- and di-phosphate are rapidly oxidised by the dialysed extract. Glycogen is oxidised in presence of the extract, lactoflavin, and codehydrase II, presumably with the intermediate formation of hexose monophosphate. Jensen sarcoma contains at least 0.002% of codehydrase II and 0.015% of cozymase but these are rapidly inactivated after the death of the animal. W. O. K.

Dehydrogenase systems in various tissues. P. E. SIMOLA, M. STENBERG, and E. UUTELA (Suomen Kem., 1937, 10, B, 34–35).—Dehydrogenation of pyruvic, α -ketoglutaric, lactic, acetic, citric, malic,
and fumaric acids by various animal tissues was studied. Pyruvic, ketoglutaric, and lactic acids had an optimum reaction at $p_{\rm H}$ 8—9, but ketoglutaric and lactic acids were dehydrogenated at $p_{\rm H}$ 10, and ketoglutaric acid at $p_{\rm H}$ 4, suggesting that these two acids are attacked by different enzymes. With rat brain, liver, kidney, skeletal and heart-muscle, and testis, pyruvic, ketoglutaric, lactic, and citric acids rapidly oxidised methylene-blue, acetic acid had no effect, and malic and fumaric acids inhibited the reaction. With chicken embryo, the reaction was very rapid (especially with lactic acid), and slowed down as the embryo aged. Rat sarcoma tissue behaved similarly, citric acid being unattacked in either case. Vitamin-B-deficient rat and pigeon tissue behaved normally.

M. H. M. A.

Dehydrogenation of pyruvic acid. P. E. SIMOLA (Suomen Kem., 1937, 10, B, 36).-The tissue extract containing dehydrogenase is frozen in liquid air and then rapidly dried at low temp. to yield an active, stable powder which gives cell-free extracts containing a pyruvic-dehydrogenase system consisting of a labile enzyme and a stable activator. M. H. M. A.

Effect of urine of pregnancy, placental extracts, prolan, serum of pregnant rabbits, and emulsified pituitary preparations on the oxidase reaction of ovaries, uterus, and other organs. K. I. KIYOHARA and S. IZAWA (J. Biochem. Japan, 1937, 26, 211-222).-Oxidase granules occur in the follicular, corpus luteum, and interstitial cells of the ovary and in the epithelial cells of the uterine mucosa and glands of guinea-pigs. Injection of the above sources of sexual hormones increases (to approx. equal extents) the oxidase reaction of the follicle (in which the granules are aggregated) and the epithelial cells of uterine mucosa and glands, whilst the oxidase contents of pituitary, thyroid, liver, and kidney are unaffected. F. O. H.

Arginine, histidine, lysine, glutamic acid, and aspartic acid from the yellow enzyme. R. KUHN and P. DESNUELLE (Z. physiol. Chem., 1938, 251, 19-22; cf. A., 1937, II, 448).—The isolation from the enzyme of arginine and histidine as flavianates, lysine as picrate, glutamic acid as hydrochloride, and aspartic acid as Cu salt is described. The enzyme W. McC. contains approx. 2% of aspartic acid.

Combination of the yellow enzyme and of its protein components with the silver ion. R. KUHN and P. DESNUELLE (Z. physiol. Chem., 1938, 251, 23-31; cf. von Euler and Svanberg, A., 1921, i, 202).—The dehydrogenation of Robison's ester by the enzyme in presence of co-enzyme and triphosphopyridine nucleotide is reversibly inhibited by low [Ag']. 1 mol. of the enzyme or of its protein component combines with approx. 6 Ag. Yeast-adenylic acid and reduced glutathione also combine with considerable amounts of Ag but manual oxidised glutathione do not combine with Ag. W. McC. able amounts of Ag but muscle-adenylic acid and

Structure and action-mechanism of hæmatincontaining enzymes. K. G. STERN (Yale J. Biol. Med., 1937, 10, 161-178).-A review of respiratory enzyme, catalase, peroxidase, and cytochrome-c,

both as regards structure and function. [Good bibliography.] A. G. W.

Adrenoxine, oxidised adrenaline inhibitor. P. HEIRMAN (Compt. rend. Soc. Biol., 1937, 126, 1264—1266).—During the oxidation of adrenaline by the tyrosinase of *Psalliota campestris*, a hypotensive substance, adrenoxine, is formed prior to the inactive adrenochrome. H. G. R.

Is adrenaline oxidised by melanogenic enzymes in mammals? P. HEIRMAN (Compt. rend. Soc. Biol., 1937, 126, 1267-1268).-No difference in sensitivity towards adrenaline was observed between albino and normal rabbits, suggesting the nonintervention of melanogenic enzymes in the oxidation of adrenaline. H. G. R.

Ultracentrifugal study of catalase. K. G. STERN and R. W. G. WYCKOFF (Science, 1938, 87, 18) .- Centrifugal analysis of purified horse livercatalase solutions affords evidence of three mol. species: (i) the predominant species, the enzyme, with a sedimentation const. of 11×10^{-13} cm. per sec. per dyne, (ii) light unsedimentable material, and (iii) heavier material with somewhat diffuse sedimenting boundaries corresponding with $S_{20^{\circ}}$ approx. 65×10^{-13} cm. per sec. per dyne. This material redissolves readily in water or saline to give coloured solutions with a max. light absorption in the violet; its sp. catalytic activity is relatively low. The sedimentation const., 11×10^{-13} , of the purified enzyme indicates that horse liver-catalase mols. are much heavier than those of hæmoglobin. The mol. wt. is probably 250,000-300,000. A catalase prep. from ox liver gave a sedimentation const. $S_{20^{\circ}} = 12 \times 10^{-13}$. L. S. T.

Distribution of carbonic anhydrase in the animal body. H. VAN GOOR (Arch. int. Physiol., 1937, 45, 491-509).-No free carbonic anhydrase was detected in plasma, coelomic fluid, bile, ink of octopus, tentacular liquid, urine, or milk. It occurs in red blood cells, in the pancreas (or in intestinal glands and pyloric appendices where pancreas is absent), and in some genital glands. C. E. B.

Phenolsulphatase. K. MORIMOTO (J. Biochem. Japan, 1937, 26, 259-274).-Rabbit's liver contains phenolsulphatase (Neuberg, A., 1925, i, 743) of optimum $p_{\rm H}$ 5.9—6.9 (with K *p*-nitrophenyl sulphate as substrate). The enzyme is not stable in glycerol extracts. Treatment of glycerol preps. with adsorptive substances generally reduces, or has no effect on, the activity; Fe(OH)3, however, increases the activity by approx. 100%. Glycerol extracts of other organs of the rabbit are inactive; those of the liver of dogs, fowls, and pigs are active. Aliphatic sulphuric esters are not hydrolysed by phenolsulphatase.

F. O. H.

Lipase. IV. Effects of reduction and oxidation on the reversible action of pancreatic lipase and pro-lipase. R. ITOH and T. NAKAMURA (J. Biochem. Japan, 1937, 26, 187-196; cf. A., 1937, III, 353).-The hydrolytic action of lipase (pig's pancreas) is accelerated by reducing, and retarded by oxidising, agents and vice versa for the synthetic action; for the acceleration of both hydrolytic and

synthetic actions of lipase, there exists an optimum val. of $r_{\rm H}$. Pro-lipase has normally only a synthetic action but a hydrolytic action occurs in presence of glutathione or nascent H; O₂ appears to favour synthesis and retard hydrolysis. The effect of proteins on lipolysis is related to their reducing properties. The action of Ca^{**} in accelerating lipolysis and retarding the synthetic action is discussed. F. O. H.

Structure of lipase, and the nature of its binding within the cell. I. S. ROIZMAN (Ukrain. Biochem. J., 1937, 10, 581-594).—A review.

R. T.

Distribution of choline-esterase in living organisms. Z. M. BACQ and A. OURY (Bull. Acad. roy. Belg., 1937, [v], 23, 891—893).—The esterase occurs in high concn. in the hæmolymph and muscles of worms and in varying concn. in the tissues (not in the hæmolymph) of arthropods but not in cœlenterates, ergot, yeast or other fungi, algæ, ferns, or green plants. *Lactarius blennius* contains an unstable choline ester but no esterase. Probably the esterase occurs only in vertebrates and some invertebrates. W. McC.

Acetylcholine-cholesterolase system. M. ZIFF, F. P. JAHN, and R. R. RENSHAW (J. Amer. Chem. Soc., 1938, **60**, 178—182).—The rate of hydrolysis of acetylcholine is proportional to the amount of cholesterolase (horse-serum) used. k is inversely proportional to the initial concn. of acetylcholine, but is depressed by choline either added as bromide or formed during hydrolysis. This is quantitatively accounted for by adsorption of acetylcholine by the enzyme and its displacement by choline. The relative affinity consts. of acetylcholine, choline, ethoxycholine, and butoxyformocholine bromides for the enzyme are 100, 87, 148, and 1110, respectively. These consts. bear no relation to the physiological activity of the substances. R. S. C.

Liver-esterases. I. S. ROIZMAN (Ukrain. Biochem. J., 1937, 10, 695—713).—Reduction in lipolytic activity is caused by prolonged extraction of fresh organs with acetone and ether and by oxidation. In rabbits, lipolytic activity of organs decreases in the order liver, spleen, kidneys, lungs. The liver-butyrase index varies widely among individuals. E. M. W.

Bacterial urease. T. WOHLFEIL and P. WEILAND (Zentr. Bakt. Par., 1937, I, 138, 388-400).-B. vulgare, Corynebacterium pseudodiphtheriticum, B. abortus, Bang, B. pseudotuberculosis rodentium, and sarcinæ all contain urease. Of 150 strains of pathogenic and non-pathogenic micrococci only 8% contained urease. B. coli contains none, but may act in symbiosis with B. vulgare. In urea-NaCl solution the action of the urease of B. vulgare depends on the no. of bacteria present. More decomp. of urea occurs in unit time in urea- $PO_4^{\prime\prime\prime}$ buffer than in urea-NaCl. This is due to physico-chemical factors and elimination of urease inhibitors (heavy-metal salts). Rates of decomp. of urea by B. pseudotuberculosis, B. vulgare, C. pseudodiphtheriticum, B. abortus, and micrococci diminished in that order. J. N. A.

Nature of arginase. S. EDLBACHER and H. PINÖSCH (Z. physiol. Chem., 1937, 250, 241—248).— Pepsin destroys arginase irreversibly. The inactivation which is caused merely by equiv. concn. of HCl can be removed by adding bivalent ions, such as Mn, Co, or Ni. Arginase may consist of a colloidal carrier of albumin type with an active group in which Mn probably plays a part. D. M. N.

Histamine production from histidine by ascorbic acid and thiols. P. HOLTZ and R. HEISE (Arch. exp. Path. Pharm., 1937, 186, 269–280).— By the action of ascorbic acid and glutathione *in* vitro, in presence of O_2 , histidine is partly converted into histamine. The other part is deaminated.

T. B. H.

Formation of histamine in the organism. P. HOLTZ and R. HEISE (Arch. exp. Path. Pharm., 1937, 186, 377–386).—Slices, emulsions, or extracts of liver and kidney when incubated with histidine give rise to histamine provided the O_2 tension is low. In the cat, which contains less histaminase, the effect is seen only in complete absence of O_2 . Other organs are inactive. T. B. H.

Formation of tyramine in the organism. P. HOLTZ (Arch. exp. Path. Pharm., 1937, 186, 684— 693).—Emulsions of rabbit or guinea-pig kidney, or their extracts, on incubation with tyrosine produce tyramine, at the estimated rate of 1 mg. per g. of tissue per 12 hr. Emulsions of liver or of pancreas do not show this action. T. B. H.

Action of arginase on octopine and its isomerides. S. AKASI (J. Biochem. Japan, 1937, 26, 129–135).—Arginase preps. from the liver of dogs, rabbits, and calves hydrolyse (optimum $p_{\rm H}$ 9.5) β -octopine, *iso*octopine, and octopine (A., 1937, II, 403) with formation of urea; the ease of hydrolysis of the three isomerides decreases in the order given and in each case is less than that of arginine.

F. O. H.

Activation of leucyl-peptidase of *Tubifex* eggs by magnesium salts. H. HOLTER, F. E. LEHMANN-BERN, and K. LINDERSTRØM-LANG (Z. physiol. Chem., 1937, 250, 237—240).—The leucyl-peptidase activity of fertilised, uncleaved eggs of *Tubifex* is considerably increased by addition of MgCl₂ at $p_{\rm H}$ 8.0. D. M. N.

Action of pepsin. J. LOISELEUR (Compt. rend., 1937, 205, 1103—1105).—The electro-kinetic potential (ζ) of proteins under the action of pepsin decreases rapidly in accordance with the extent of combination between the substrate (edestin, gelatin) and enzyme. This is followed by a gradual increase in ζ as the hydrolysis proceeds. A. L.

Rôle of pepsin in the *in-vitro* digestion of proteins. V. RANGANATHAN and B. N. SASTRI (J. Indian Inst. Sci., 1937, 20, A, 83–86).—Pepsin exerts a solubilising action on the N of pulse proteins, due to proteolysis. The amount of N solubilised varies with different materials, Bengal gram (*Cicer arietinum*, L.) giving $87\cdot1\%$ and black gram (*Phaseolus radiatus*) $47\cdot9\%$ solubilisation of N. J. L. C.

Sterilisation of pepsin. C. G. VAN ARKEL (Pharm. Weekblad, 1938, 70, 42-45).—Pepsin entirely loses its activity when passed through a Seitz filter or when sterilised at 50—56° in presence of Na benzoate and chloretone. Its activity is largely retained by filtration through a glass Schott G5 bacterium filter or after treatment below 46° with pure CS_2 but in this case the prep. is not sterile. S. C.

Effect of trypsin and antitryptic serum on the blood-polypeptides of the rabbit. G. BENETATO, C. OPRISIU, and P. CIURDARIU (Compt. rend. Soc. Biol., 1937, 126, 1039—1041).—Repeated intramuscular administration of trypsin produces transient hyper-followed by hypo-polypeptidæmia, accompanied by an increase in the antitryptic power of the serum. The antitryptic serum produces a hypopolypeptidæmia. H. G. R.

Proteolytic enzymes of rabbit's pancreas. III. Activation of secreted trypsinogen. IV. Proteolytic enzymes of the pancreas with ligatured duct. F. ITZIOKA (J. Biochem. Japan, 1937, 26, 37-48, 75-80; cf. A., 1937, III, 97).—III. The activation of pancreatic trypsinogen is not affected by a current of air or coal gas or by addition of HCl, H_2SO_4 , or NaOH but is complete after treatment with a kinase prep. (from mucosa of the small intestine) at 37° for 30 min. Blood elements and various dried tissues are without action. The self-activation of pancreatic juice is probably related to the slight activation by macerates of kidney, spleen, and stomach. Various salts (including some of Ca) and bile do not activate.

IV. Maceration juice from the ligatured pancreas has no tryptic activity, activates normal pancreatic juice, and readily hydrolyses di- and tri-peptides but not chloroacetylphenylalanine or peptone. The maceration juice of the mucosa of the small intestine of rabbits with ligatured pancreas hydrolyses gelatin. F. O. H.

Cathepsin specificity. B. GOLDSCHTEIN and E. J. MILGRAM (Ukrain. Biochem. J., 1937, 10, 267— 286).—Kidney- and liver-cathepsin hydrolyse the protein of the sp. organ more rapidly than gelatin, whereas muscle-cathepsin has no action on gelatin. P. G. M.

Cathepsin in the tissue of embryo and mother. B. GOLDSCHTEIN and GINTZBURG (Ukrain. Biochem. J., 1937, 10, 647—662).—The liver-extracts of pregnant rabbits show a more rapid disappearance of reduced glutathione, an earlier and stronger activating effect of H_2S , and a higher cathepsin concn. than do those of normal rabbits. E. M. W. Protease and proteolytic processes in the organism. IV. Proteolytic processes in various tissues on prolonged storage under industrial conditions. S. V. FOMIN, L. S. TSCHERKASSOVA, and P. M. GUTNITZKAJA (Ukrain. Biochem. J., 1937, 10, 351–363).—Proteolysis in liver, brain, and adrenal is increased after 2–4 months' cold storage without, and even more with, defrosting. Aminogenesis in liver and muscle is similarly affected. Loss of water also takes place. P. G. M.

Rates of digestion of starches and glycogen. III. Human liver amylase. G. E. GLOCK (Biochem. J., 1938, 32, 235–236; cf. A., 1937, III, 67).— The hydrolysis of glycogen and potato starch by two acetone-extracted and dried human liver preps. was followed. Both possessed positive maltase activity. Maltose was the sole end-product in the early stages of hydrolysis, but after 48 hr. this was gradually converted into glucose. Human serum had a slight maltase, but no amylase, activity. J. N. A.

Hydrolysis of glycogen by glycerol extract of muscle. A. M. WALKER and F. G. YOUNG (Biochem. J., 1938, 32, 94–100).—Hydrolysis of glycogen by a glycerol extract of muscle yielded only reducing substances corresponding with (as glucose) approx. 38% of the glycogen used. A pure trisaccharide was not obtained but an *acetyl* derivative, $[\alpha]_{\rm D}$ +92° (C 49·23, H 5·75; Ac content 48.6%), was prepared. The product may be a mixture of maltose and oligosaccharide or dextrin. P. G. M.

Enzymic amylolysis. VII. Enzymic dephosphorylation of wheat starch. E. WALDSCHMIDT-LEITZ, M. SAMEC, and K. MAYER (Z. physiol. Chem., 1937, 250, 192—196; cf. A., 1936, 1298).—Kidneybut not amylo-phosphatase liberates more than 85% of the constituent P from wheat starch, the NH₂-N content, but not the reducing power, simultaneously increasing. Creatinephosphoric acid behaves similarly. Electrodialysis of the (partly flocculated) hydrolysate followed by removal of the insol. fraction and pptn. by 60% alcohol yields a starch, $[\alpha] -195^{\circ}$, total N 0.26%, NH₂-N and P nil, giving a pure blue colour with I and containing 30 glucose residues.

F. O. H.

Spectrographic study of the hydrolysis of sucrose and maltose by invertase and maltase. B. SKARŻYŃSKI (Bull. Acad. Polonaise, 1937, A, 217– 231).—During enzymic hydrolysis of sucrose and maltose the continuous absorption changes to selective absorption with max. at 2690—2740 and 2600—2650 A., respectively, presumably owing to formation of secondary products. R. S. C.

Mechanism of enzymic degradation of carbohydrates. O. MEYERHOF (Ergebn. Physiol., 1937, 39, 10-75).—A review. W. McC.

Correlation between acetaldehyde and pyocyanine + molecular oxygen in fluoride-poisoned apozymase systems. A. LENNERSTRAND (Naturwiss., 1938, 26, 45–46).—In systems containing apozymase, pyocyanine, NaF, etc. (A., 1936, 380), acetaldehyde utilisation and O_2 consumption are linear functions of the logarithm of cozymase concn. The O_2 consumption is decreased (proportionately) by addition of acetaldehyde. Triose phosphate is more rapidly oxidised by acetaldehyde than by pyocyanine + mol. O₂. In preps. of living bakers' yeast, the glucose respiration is inhibited by acetaldehyde.

F. O. H.

Effect of cardio-kinetic glucosides in the fission of sodium glycerophosphate by kidneyphosphatase. M. COVELLO (Annali Chim. Appl., 1937, 27, 528—534).—Hydrolysis of Na β -glycerophosphate by phosphatase (pig's kidney) is inhibited by adonidin, digitalin, and k-strophanthin, max. inhibition (at a concn. of 0.4%) being 40.3, 54.4, and 77.9%, respectively. The inhibition is a linear function of the concn. of glucoside. F. O. H.

Hydrolysis of α - and β -glycerophosphates. K. Наянимото (J. Biochem. Japan, 1937, 26, 137-159). -The three monophosphatases from kidney and rice bran (Hotta, A., 1935, 122) hydrolyse β-glycerophosphate (and hexose diphosphate) at the same rate; with α -glycerophosphate (and hexose phosphate), the rate of enzymic action increases with increase in $p_{\rm H}$ optimum (3.0, 5.6, and 9.0, respectively). The rate of hydrolysis of diphosphoglycerate by the enzyme with optimum $p_{\rm H}$ 5.6 is slightly greater than that by either of the other two. Further data with propyl and isopropyl phosphate are tabulated. α - and β -Glycerophosphates are hydrolysed by various monophosphatase preps. from yeast and erythrocytes. Hydrolysis of a-glycerophosphate by erythrocytephosphatase is not increased by a-glycerophosphatedehydrogenase. The bearing of the data on the constitution of the glycerophosphates is discussed. F. O. H.

Vitamin-C and phosphatases. K. V. GIRI (Nature, 1938, 141, 119).—Oxidation of vitamin-C inhibits the activity of phosphatase; glutathione counteracts this inhibition. The significance of these facts in plant metabolism is discussed. C. A. K.

Steric correspondence of the biological glycerol- α -phosphoric acid and β -phosphoglyceric acid.—See A., II, 81.

(v) MICROBIOLOGICAL AND IMMUNOLOGICAL CHEMISTRY.

Heavy hydrogen in biological cellular processes. K. THEIS (Woch. Brau., 1938, 55, 36—39). —A review, with special reference to yeast development and enzyme reactions in media containing D_2O , the relationships between observations recorded during yeast growth and fermentation and modern theories of polysaccharide synthesis and fermentation changes being discussed. I. A. P.

Evolution and yield of alcohol from the fermentation of a very dilute solution of glucose by yeast. C. DUMAZERT and G. PENET (Compt. rend. Soc. Biol., 1938, **127**, 75—77).—The yield of alcohol from a dil. is less than that from a conc. solution of glucose. The val. reaches a max. (const. for the same concn. of glucose) after $2\frac{1}{2}$ hr. fermentation. The possibility of applying the results to micro-determination of glucose is discussed. H. G. R. Action of growth-factor on various types of yeast and mould. N. NIELSEN and F. SING-FANG (Compt. rend. trav. Lab. Carlsberg, Sér. physiol., 1937, 22, 141—154).—The development of 6 species of yeast and 3 of moulds in various media containing growth-factor B confirms the possibility of the division of B into two groups, B_1 (yeast-active) and B_2 (active towards Aspergillus niger). Shaking wort with yeast poor in B_1 (mineral-cultivated) removes almost all the B_1 from the wort, whilst wort-cultivated yeast removes much less. Differences in response to growth factors are shown by individual yeasts and moulds. The effects are probably sp., and results obtained from study of one organism cannot be applied directly to another. I. A. P.

Effect of iron in the ionic form or as complexes of ascorbic or dehydroascorbic acid on alcoholic fermentation by yeast. F. ARLOING, A. MOREL, A. JOSSERAND, and M. J. PERRET (Compt. rend. Soc. Biol., 1937, 126, 1014—1015).—Fe^{II} either as the ion or the complex is an inhibitor. Fe^{III} is a complete inhibitor in the ionic form, this action being lost in the complexes, particularly with dehydroascorbic acid. H. G. R.

Flavin content of yeast cultivated in presence of cyanide. A. GOURÉVITCH (Compt. rend. Soc. Biol., 1938, 127, 216—217).—The flavin content of yeast is increased by the addition of cyanide to the medium, the production of a substance having a blue fluorescence not being observed (cf. Pett, A., 1935, 663). H. G. R.

Dinucleotidepyrophosphoric acid of yeast.— See A., II, 81.

Magnesium as an activator of biochemical conversions. V. S. BUTKEVITSCH and E. I. TROFIMOVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 17, 221—225).—Transference of mycelium of Aspergillus niger from the customary nutrient to aq. $MgSO_4$ for 24 hr. increased its subsequent activity in converting sugar into citric acid and acetic into oxalic acid. A. G. P.

Anaërobic metabolism of mould fungi in relation to citric acid formation. T. G. TOMLIN-SON (New Phytol., 1937, 36, 418—434).—Normal alcoholic fermentation (zymase) occurs in anaërobic cultures of various species of Aspergillus and *Penicillium*. Zymase activity is unrelated to citric acid production. Peptone cultures of A. niger ferment sugar in absence of O_2 . In presence of CaCO₃ P. divaricatum and P. sanguifluus produce citric acid at rates exceeding that of alcohol formation. Production of CO₂ in air and in N₂ is examined and results are utilised in a discussion of the mechanism of the fermentation process.

A. G. P.

Fluorescence of the pigment from cultures of *Penicilliopsis clavariæformis.* C. DHÉRÉ and V. CASTELLI (Compt. rend. Soc. Biol., 1937, **126**, 1061—1064).—Oxypenicilliopsin is identical spectroscopically with the "mycoporphyrin" isolated by Dhéré (A., 1934, 121). The fluorescence spectra in various solvents and after treatment with H₂SO₄ and NaOH are described. H. G. R. XIX(v)

Production of thiourea by fungi. K. E. OVTSCHAROV (Compt. rend. Acad. Sci. U.R.S.S., 1937, **16**, 461—464).—Fungal tissue is extracted with alcohol, the dry matter of the extract is decolorised by C in water, and thiourea in the solution is determined spectrometrically by the intensity of absorption of ultra-violet rays. Production of thiourea by *Botrytis cinerea* and *Verticillium alboatrum* occurs when N is supplied as NH_4^{-} but not when supplied as NO_3' . Thiourea is present in plants infected with rust, and causes a diminution of photosynthetic activity, the effect being intensified in bright sunlight. A. G. P.

Effect of aneurin on the growth of Ustilago violacea. W. H. SCHOPFER (Ber. deut. bot. Ges., 1937, 55, 572—576).—Highly purified saponins have only a moderate stimulative effect on the growth of U. violacea. Positive effects of commercial preps. may be due to presence in them of vitamin- B_1 or a growth substance, e.g., aneurin. The two components of aneurin, 4-amino-2-methyl-5-aminomethylpyrimidine and 4-methyl-5- β -hydroxyethylthiazole, together have the same effect as the whole aneurin mol. on growth of U. violacea. A. G. P.

Determination of flavin produced by cultures of *Eremothecium Ashbyii*. A. RAFFY and M. FONTAINE (Compt. rend., 1937, 205, 1005—1006).— *E. Ashbyii*, grown on a Gorodkowa medium at 27°, rapidly produces a flavin in amounts (determined spectrophotometrically) which increase with age to a max., and later decrease to a final const. val. A peptone-glucose medium is less favourable for production of the flavin. J. D. R.

Effect of mineral salts on mycolysis. M. WELSCH (Compt. rend. Soc. Biol., 1937, 126, 1254— 1257).—The action of salts on mycolysis is indirect, depending on their effect on the growth of the mould rather than on the bacteriolysis. H. G. R.

Culture of various leucophytic flagellates on a synthetic medium. A. Lvov and H. DUSI (Compt. rend. Soc. Biol., 1938, 127, 53—56).—Polytomella cæca and Chilomonas paramecium require both the thiazole and pyrimidine moieties of aneurin for growth, Polytoma ocellatum and P. caudatum require only the thiazole, whereas P. obtusum and P. uvella can synthesise both fractions. P. ocellatum can utilise NO_3' as sole source of N. H. G. R.

Pyrimidine and thiazole, growth factors for the flagellate Polytomella cæca. A. Lvov and H. DUSI (Compt. rend., 1937, 205, 630-632).-10⁻⁹N-vitamin-B greatly increases the growth rate at 20° in a synthetic medium containing asparagine at $p_{\rm H}$ 6.5. Neither 4-methyl-5- β -hydroxyethylthiazole nor 4-amino-2-methyl-5-aminomethylpyrimidine has any effect but jointly they act like $-B_1$. When asparagine and Na acetate are replaced by NH₄ acetate, there is no growth even when tryptophan, cysteine, and nicotinamide are added, which indicates that the asparagine used was not merely a source of N but contained adsorbed growth factors as impurities. J. L. D.

Thiazole, a growth factor for the flagellates Polytoma caudatum and Chilomonas paramec-S (A., III.) ium. A. Lvov and H. DUSI (Compt. rend., 1937, 205, 756–758; cf. A., 1938, III, 15, and preceding abstract).—*P. caudatum* shows poor growth in an asparagine medium at $p_{\rm H}$ 7.5. Synthetic vitamin- B_1 increases the growth-rate 200 times, as does the thiazole moiety of the mol. The pyrimidine moiety is without action. *C. paramecium* behaves similarly. J. L. D.

Comparative action of normal and icteric human serum on the culture of dysentery amœba. C. DOPTER and R. DESCHIENS (Compt. rend. Soc. Biol., 1937, 126, 969—972).—The growth of the amœba is increased sixfold by icteric compared with normal serum. H. G. R.

Influence of alternating current on aquatic animals. FE. SCHEMINZKY and FR. SCHEMINZKY (Z. vergl. Physiol., 1937, 25, 170—192).—The reactions of aquatic protozoa and metazoa to an applied a.c. field (50 Hz) were studied. Various types of reactions (e.g., orientation of the body, fixation) occur which depend on the c.d. in the fluid. The required c.d. decreases with increasing body size. "Fixation" is obtained with strong currents due to general tetanic activity. If the current lines pass the body in a longitudinal direction, a lower intensity in required for a given response than with transverse currents.

B. K.

Memory of Spirostomum ambiguum major. S. WAWRZYŃCZYK (Acta Biol. Exp., 1937, **11**, 57— 77).—Spirostoma react to mechanical stimuli by contraction. This reaction is abolished after prolonged rhythmic stimulation, but again appears if the rhythm is changed. The non-reactivity is due not to fatigue, but to the infusoria becoming accustomed to non-noxious stimuli. If the intervals between stimuli are lengthened during the reactive period, the infusoria continue to react at the old rhythm for some time. Non-responsive spirostoma again react 47 min. after cessation of stimulation. R. T.

Relation of certain respiratory enzymes to maximum growth temperatures of bacteria. O. F. EDWARDS and L. F. RETTGER (J. Bact., 1937, 34, 489—515).—With many bacilli examined the max. growth temp. was closely related to the min. temp. of destruction of indophenol oxidase, catalase, and succinodehydrogenase. A thermostable peroxidase occurred in all species but no evidence of the presence of H_2O_2 was obtained. A. G. P.

Graphical representation of bacterial multiplication. Variation in the latent phase as a function of the number of cells shown. M. FAGUET (Compt. rend. Soc. Biol., 1937, 126, 967— 968).—The method (A., 1935, 535) has been modified to enable the growth of two cultures to be observed simultaneously. The time necessary to obtain a given concn. of bacteria is inversely proportional to the no. of cells sown. H. G. R.

Utilisation of various sugars and their derivatives by bacteria. L. STERNFELD and F. SAUN-DERS (J. Amer. Chem. Soc., 1937, 59, 2653—2658).— The production or absence of gas and/or acid from 27 sugars or sugar derivatives by 16 bacteria and 3 yeasts in peptone-beef extract at $p_{\rm H}$ 5.2—6.8 is determined. C_5 - and C_6 -sugars are most readily attacked, hexoses more readily than pentoses except for *d*-lyxose and *d*-galactose. C_7 - and C_8 -sugars are not attacked, but a nonose was fermented by 3 organisms. Naturally occurring forms are more frequently fermented than are their enantiomorphs or any of their derivatives. Change of CO to CH-OH or CO₂H renders the compound less susceptible to attack. Glucosides are still less generally fermented. Substitution of $C_{(2)}$ by NH₂ has little effect. Mucic acid may be used to distinguish between certain closely related bacteria. R. S. C.

Physico-chemical properties of active principles in bacterial filtrates causing local skin reaction. G. SHWARTZMAN and S. A. MORELL (J. Exp. Med., 1938, 67, 1-12).-Ultrafiltration through graded filters shows the approx. particle size to be 50—100 mµ.; with lower porosities the filtrate is inactive. Fractional pptn. with $(NH_4)_2SO_4$ gives the most active prep. at 2/3 saturation. Capillary analysis by adsorption to cellulose shows retention of the positive charge at $p_{\rm H}$ 4.3. By cataphoresis the probable isoelectric point is at $p_{\rm H} 3.0-4.0$. The active principle can be adsorbed to basic Ca phosphate; it can be extracted with fat solvents without loss of potency if it is prepared by freezing and evaporation in vac.; it withstands $p_{\rm H}$ variations from 3.0 to 10.0 and is thermostable at $p_{\rm H} 10.0$. A. C. F.

Active principles in bacterial filtrates causing local skin reaction produced in fluid medium by dialysis. S. A. MORELL and G. SHWARTZMAN (J. Exp. Med., 1938, 67, 13—23).—Bacteria are grown in a Cellophane sac containing saline, immersed in nutrient broth. The culture filtrate is redialysed against saline and active preps. practically free from non-sp. contaminants are thus obtained. A. C. F.

Amino-groups and inactivation of microbial toxins. L. VELLUZ (Compt. rend. Soc. Biol., 1938, 127, 35–37).—Inactivation of toxins by substances such as keten is probably due to blocking of the $\rm NH_2$ -group. H. G. R.

Solubility and chemical and physical absorption of nitrogen in Azotobacter cells. H. LINE-WEAVER (J. Biol. Chem., 1938, 122, 549-567).-Determination of isotherms for the solubility at 0.7-25° of N₂ (pressure 0.18-1.0 atm.) in water, nutrient medium alone and containing 1% of sucrose, and in aq. suspensions of A. vinelandii, legume nodule bacteria (Rhizobium meliloti), and yeast shows that the suspensions do not reversibly adsorb, or combine chemically with, measurable amounts of N2, the uptake of N₂ being proportional to the N₂ pressure. Dried Azotobacter and powdered yeast reversibly take up measurable amounts of N_2 or A at 0° and at -183° . The amount of N₂ taken up by dried Azotobacter is doubled at 0° and increased 20-fold at -183° by powdering. Unpowdered yeast takes up no N2 or A but powdered yeast takes up 25% of the amount of N2 taken up by Azotobacter. W. McC.

Chromoresistance and calcium phosphate adsorption of microbes heated in milk. G. GUITTON-NEAU and M. BEJAMBES (Compt. rend., 1937, 205, 1013—1015).—A culture of Streptococcus thermophilus heated for 1 hr. at 100° in de-fatted milk becomes resistant to staining by methylene-blue. This property is not removed by washing with 4% aq. NaOH or NH₃, but staining is normal after treatment with aq. CO₂. The resistance is due to adsorption of $Ca_3(PO_4)_2$ on the surface of the organism. Chromoresistant microbes are stained brown by AgNO₃, due to formation of Ag₃PO₄. J. D. R.

Decomposition of cellulose by Cytophaga. I. E. WALKER and F. L. WARREN (Biochem. J., 1938, 32, 31-43).—C. Hutchinsoni, an aërobic organism, decomposes cellulose, two thirds of which appears as CO_2 , and one third principally as mucilage, together with a yellow dye (considered to be an unsaturated aliphatic acid of relatively small mol. wt.), a higher fatty acid, and a carbohydrate sol. in 75% alcohol. No other carbohydrates except cellulose are decomposed by Cytophaga. The mucilage is probably an oxycellulose of acidic non-reducing type. Xylose has been identified among its hydrolytic products. Using extensive oxygenation it is possible to obtain 50% decomp. of cellulose in approx. 8 days. The biological significance of this type of decomp. is discussed.

J. N. A. Fusobacterium genus. I. Biochemical and serological classification. II. Growth requirements and variation. E. H. SPAULDING and L. F. RETTGER (J. Bact., 1937, 34, 535—548, 549—562).— I. Two groups are distinguished according to the amount of acid produced from carbohydrates and to ability to ferment maltose and trehalose, to produce indole or H_2S , and to reduce NO_3' .

II. Growth conditions are examined. Potato extract containing glucose and cysteine supports vigorous development of both groups. A. G. P.

Phosphorylation by the living bacterial cell. W. P. WIGGERT and C. H. WERKMAN (Biochem. J., 1938, **32**, 101–107).— H_3PO_4 in a suspension of *Aërobacter aërogenes* increases with time by virtue of a depletion of reserve substances in the cell; it is less in the presence than in the absence of glucose, which increases the esterification of P. P. G. M.

Filtration of suspensions of micro-organisms through filter-paper and "5 on 3" Jena sintered-glass filter. G. R. MILNE (Pharm. J., 1938, 140, 5-6).—B. megatherium and B. coli, especially in dil. suspension, pass readily through ordinary filter-papers but not through the glass filter.

W. McC.

Fermentation of lactate by coli-aërogenes bacteria. G. SJÖSTRÖM (Proc. XIth World's Dairy Cong., Berlin, 1937, 2, 556—559).—Acetic acid and CO_2 , not in mol. proportions, are fermentation products. Less acetic acid is formed at low O_2 tensions and the $p_{\rm H}$ increases during the fermentation, especially in aërobic cultures. The max, amount of acetic acid is formed at $p_{\rm H}$ 6—7. W. L. D.

Growth inhibition of Escherichia coli. K. M. WHEELER and C. A. STUART (J. Bact., 1937, 33, 525-531).—In broth cultures *E. coli* produces a thermostable, dialysable inhibitory substance which is non-sp. A. G. P. Fission of *d*-glucosamic acid by micro-organisms and in the animal body. M. IMAIZUMI (J. Biochem. Japan, 1937, 26, 197—202).—Ingestion of *d*-glucosamic acid by dogs and rabbits is followed by excretion of acetic, oxalic, and *d*-lactic acids in the urine. *B. coli* convert the acid into *d*-lactic and succinic acids; paratyphoid *B* bacilli (*Salmonella schottmülleri*) produce only succinic acid. F. O. H.

Reduction of nitrates to nitrites by bacteria. E. AUBEL, O. SCHWARZKOPF, and GLASER (Compt. rend. Soc. Biol., 1937, **126**, 1042—1043).—Reduction of NO_3' to NO_2' by *B. coli* occurs either by xanthine oxidase without the enzyme sensitive to KCN or by other dehydrogenases together with the enzyme sensitive to KCN. H. G. R.

Toxin of Bacterium coli. IV, V. Exo- and endo-toxin. VI. Characteristics of a strain of B. coli. A. LIGAS (Boll. Soc. ital. Biol. sperim., 1937, 12, 667—669, 669—670, 670—671; cf. A., 1937, III, 454).—IV. Broth cultures (24 hr. and 4—5 days) of B. coli, filtered through a Berkefeld candle and injected into rabbits before and after heating (at 90° for 1 hr.), afford no evidence of the presence of a neurotropic, thermolabile exotoxin.

V. Fractionation of filtrates of *B. coli* cultures by Na β -naphthylamine-3:6:8-trisulphonate or trichloroacetic acid indicates that the exotoxin is possibly identical with the polysaccharide.

VI. A strain (S phase) of B. coli isolated from human fæces was agglutinated only by serum from rabbits inoculated with the same strain. Attempts to extract the polysaccharide yielded preps. of high toxicity but free from immunising power, probably due to the presence of the lipin fission product of the polysaccharide. The strain does not liberate toxin into the broth culture. F. O. H.

Metabolism of dicarboxylic acids by Bacterium coli. L. CALIFANO and I. BANGA (Z. physiol. Chem., 1937, 250, 234—236; cf. Szent-Györgyi et al., A., 1935, 1406).—The O₂ consumption of washed B. coli in presence of glucose is not inhibited by malonate; traces of fumarate have no effect whilst larger amounts increase the consumption. Fumaric, succinic, oxalacetic, and malic acids are all completely oxidised to CO_2 and H_2O . Oxalacetic acid is oxidised at the same rate aërobically or anaërobically, whilst presence of glucose or hexose diphosphate as donator has no effect on its aërobic oxidation. F. O. H.

Selective growth of Streptococcus agalactiae and Brucella Bang. I. G. VOGLER. II. O. KOHANE (Milch. Forsch., 1937, 19, 130–134, 135– 138).—I. LiClO₃ inhibits S. lactis in 0.1% concn. while $Co(ClO_3)_2$ is lethal at 0.02%. Mastitis organisms can grow in 0.5% LiClO₃ and 0.1% $Co(ClO_3)_2$. A combination of 0.01% $Co(ClO_3)_2$ and 0.1% LiClO₃ was equally selective. B. coli was resistant to these concns. and Brucella slightly less resistant.

II. S. lactis was inhibited by 0.5% NiSO₄, 0.1% SbCl₅, and 0.0025% tartar emetic, whilst mastitis streptococci could tolerate 0.25, 0.5, and 0.01%, respectively. Coliform and mastitis organisms were killed by TeCl₂, TeCl₄, and TlCl₄ but the latter were

more tolerant. B. coli is very sensitive to TeCl_2 and TeCl_4 (0.0025%) but Brucella can tolerate up to 0.01%. W. L. D.

Metabolism of the strict anaërobes (Clostridium). VII. Decomposition of pyruvate and *l*-glutamate by Clostridium tetanomorphum. D. D. Woods and C. E. CLIFTON (Biochem. J., 1938, 32, 345—356; cf. A., 1937, III, 487).—Both pyruvate and *l*-glutamate are decomposed by Cl. tetanomorphum with production of H_2 , CO₂, and acetic and butyric acids; the former alone also yields lactic acid and the latter NH₃. *l*-Glutamate is decomposed at twice the rate of the *d*-isomeride. Quant. aspects of the reactions are discussed. P. G. M.

*R***- and S-Forms of diphtheria bacilli. I, II.** M. BERGONZINI and L. J. YANG (Boll. Soc. ital. Biol. sperim., 1937, **12**, 683—684, 684—686).—I. The histological and biochemical differentiation of the two forms is described. Toxigenic properties and virulence are greater in the *R*-form.

II. Examination of various strains of diphtheria bacillus confirms the greater toxigenic activity of the R-form. Growth in agar-liver-peptone broth affords a method of differentiating the R- and S-forms.

F. O. H.

Sugar-lipin antigen of Pasteurella. I. PIROSKY (Compt. rend. Soc. Biol., 1938, 127, 98—100).—The biological and chemical properties of the antigen are analogous to those of the sugar-lipin complex of Boivin and Mesrobeanu (A., 1937, III, 227). This complex represents the endotoxin and complete antigen-H of the organism. H. G. R.

Action of hydrogen ions on the dehydrogenases of Staphylococcus aureus. D. BACH and J. LAMBERT (Compt. rend. Soc. Biol., 1937, 126, 1087—1089).—The lactic-dehydrogenase is not affected by treatment of the organism with buffer mixtures ($p_{\rm H} 4.0$ —10.1) for 30 min. at 30°, whilst the other enzymes are progressively destroyed at $p_{\rm H}$ vals. outside the range 5.0—9.61. The zones of action and the optimum activity of the various dehydrogenases have been determined. H. G. R.

Relation between growth of Mycobacterium tuberculosis and yield of tuberculin on synthetic media. S. C. WONG (J. Bact., 1937, 33, 451-460). —Substitution of glucose-sucrose for glycerol in the customary media produces an approx. threefold increase in the yield of the protein. An alkaline terminal $p_{\rm H}$ is an important factor in the rapid production of tuberculin by *M. tuberculosis*, H 37. A. G. P.

Virulence of tubercle bacilli in fæcal matter. A. CARVALHO, C. VIDAL, and J. ROCHETA (Compt. rend. Soc. Biol., 1938, **127**, 246—248).—No difference was observed in the virulence of organisms obtained from sputum and the corresponding fæces.

H. G. R. Effect of vitamin-C on the culture of H 37 tubercle bacillus. F. H. HEISE and W. STEENKEN (Ann. intern. Med., 1937, 11, 1039—1042).—Vitamin-C modifies the growth of tubercle bacilli *in vitro*, but guinea-pig inoculations showed no change in virulence. C. A. K. Diminution of the virulence of the variant S of two strains of the avian tubercle bacillus after several years of *in-vitro* culture on glycerinated potato. A. SAENZ (Compt. rend. Soc. Biol., 1938, 127, 186–188).—A decrease in virulence occurred, although the smooth appearance of the culture was not lost. H. G. R.

Relationship between bacterial growth and phage production. A. P. KREUGER and J. FONG (J. Gen. Physiol., 1937, 21, 137-150).—The effects of temp. and $p_{\rm H}$ on the reaction between antistaphylococcus phage and susceptible staphylococcus show that the production of phage is not dependent on bacterial growth, but that, by the proper selection of temp. and acidity, the two processes can be separated completely. The optimum temp, for phage production is approx. 35°, and for bacterial growth 40°. With increasing acidity there is an increasing latent period of bacterial growth, but no increase in the latent phase of phage production. With increasing alkalinity, there is no change until $p_{\rm H}$ 8.5, when the time of lysis is delayed, and the phage present at lysis is about 8-10 times the amount usually present. At $p_{\rm H}$ 6 and 28°, production of phage at a rapid rate occurs, although there is no bacterial growth.

A. E. W.

Variations in filterability of different races of bacteriophage. N. R. GOLDSMITH (J. Bact., 1937, 33, 495–498).—Different races of phage probably exhibit differences in filterability through Chamberland candles. A. G. P.

Rôle of lysin-B in the action of bacteriophage. V. SERTIC (Compt. rend. Soc. Biol., 1937, 126, 1074— 1076).—Some phages can only act on bacteria containing the substance B if the bacteria have previously been treated with lysin-B. H. G. R.

Differentiation between Salmonella pullorum and S. sanguinarum by means of a specific bacteriophage. J. V. MUNNÉ (Compt. rend. Soc. Biol., 1937, **126**, 1228—1230).—A bacteriophage, theoretically sp. for S. pullorum isolated from the excreta of a chick, cannot be used to differentiate between various strains of Salmonella. H. G. R.

(A) Purification of the lysozyme of egg-white.
(B) Properties of the purified lysozyme. R.
LINZ (Compt. rend. Soc. Biol., 1937, 126, 1279—1280, 1281—1282).—(A) The use of acetone is preferable to that of ethyl alcohol for purification of the lysozyme.

(B) The lysozyme is stable at 100° in acid solution and is insol. in ether. Pptn. of the lysozyme by alcohol and acetone is discussed. H. G. R.

Ultracentrifuging of various bactericidal agents of normal rabbit's serum. A. GRATIA and L. GORECSKY (Compt. rend. Soc. Biol., 1937, 126, 1252—1254).—Sedimentation of α -lysin, β -lysin, and lysozyme (in decreasing order) has been observed, the inactivation of these fractions in the lower portions of the clot being in the same order. H. G. R.

Influenza virus and the developing egg. V. Differentiation of two antigenic types of human influenza virus. F. M. BURNETT (Austral. J. Exp. Biol., 1937, 15, 369-374).—The available strains

of influenza virus can be divided into three sharplydefined antigenic groups, of which two comprise strains of human origin, the third containing the virus of swine influenza. The strains "Melbourne," "Philadelphia," and "P.R.8" form one group (New World type) and the strains "W.S.," "B.H.," "Moscow," and "Leningrad" another (Old World type). This differentiation has been shown (a) by titration of convalescent ferret sera against representative strains on the chorioallantois and by intranasal inoculation in mice, (b) by active immunity tests in mice and ferrets, and (c) by antibody adsorption methods. D. M. N.

Influenza virus and the developing egg. D. LUSH and F. M. BURNETT (Austral. J. Exp. Biol., 1937, 15, 375-383).-Egg membrane lesions produced by any of the three antigenic types of influenza virus provide satisfactory antigen for complement fixation. The optimal concn. of antigen varies according to the type of serum tested. Adult human sera and sera from hyperimmunised animals show a low optimal concn. of human type antigen; sera from young children and convalescent ferrets a high optimal concn. All sera need a high concn. of "swine" type antigen to give optimal fixation. Cross tests with convalescent ferret sera show best fixation with the homologous strain, but the degree of specificity is small compared with that shown in neutralisation tests. Human sera usually fix complement to about the same degree with both human and "swine" type antigens.

D. M. N.

Ultracentrifuging of vaccine virus cultivated in vitro. A. GRATIA and H. PLOTZ (Compt. rend. Soc. Biol., 1938, 127, 123-125).—Practically complete sedimentation of the virus is obtained by moderate centrifuging, any increase in the latter having a destructive effect on the virus in the clot. H. G. R.

Methods for the culture of *Rickettsiæ*, particularly regarding the production of vaccines against typhus. H. ZINSSER, H. WEI, and F. FITZPATRICK (Compt. rend. Soc. Biol., 1938, **127**, 229— 232).—A cultural method utilising gelose containing horse serum and saline and animal tissue is described. H. G. R.

Mode of dissemination of potato virus X. J. B. LOUGHNANE and P. A. MURPHY (Nature, 1938, 141, 120—121).—Virus X is readily disseminated within a potato crop by leaf contact, probably mainly due to air currents. L. S. T.

Virus proteins—a new group of macro-molecules. W. M. STANLEY (J. Physical Chem., 1938, 42, 55—70, and Ergebn. Physiol., 1937, 39, 294— 347; cf. A., 1937, III, 147, 228).—Surveys of recent work. F. L. U.

Influence of salts dissolved in sea-water on the growth of some bacteria. F. VASCELLARI (Boll. Chim. farm., 1937, 76, 645—646, 649—650).—Sea-water has a bactericidal action towards typhoid and paratyphoid bacilli. None of the salts present in sea-water has a sp. bactericidal action, which is determined rather by the high salt concn. B. coli

shows a marked adaptability to its environment in sea-water. O. J. W.

Specific bactericidal activity. XVI. Gramspecificity and bacterial substrate. Biological differentiation of the two groups. F. EISENBERG (Bull. Acad. Polonaise, Cl. Méd., 1937, 55–69).—A review of the various physical and chemical properties of bacteria and their immunity to bactericidal agents with special reference to their Gram-positive or -negative character. W. O. K.

Organisms in the interior of bread made with yeast or leaven. Effect of cooking and $p_{\rm H}$. E. AUBERTIN, A. DANGOUMEAU, E. LEURET, and F. PIECHAUD (Compt. rend. Soc. Biol., 1938, 127, 64-66).—Non-sporing bacteria are destroyed during the cooking since a temp. of 100° is reached. In bread made with leaven sporing organisms are destroyed by the acidity, which reaches $p_{\rm H} 4.4-4.6$. H. G. R.

Bactericidal power of *Culex pipiens*, strain autogenic to *B. coli*. H. VIOLLE and J. SAUTET (Compt. rend. Soc. Biol., 1938, **127**, 80–82).—The bactericidal action is due to a heat-labile substance present in the nymph of 48—72 hr. and a less active heat-stable substance present in the adult insect.

H. G. R. Bacterial culture in a medium having sodium stearate as the sole source of carbon. E. POZER-SKI (Compt. rend. Soc. Biol., 1937, 126, 972—974).— Na stearate, unlike Na oleate, can be used as a sole source of C for *B. coli* but is less effective than glucose. H. G. R.

Advantages of peptone iron agar for the routine detection of hydrogen sulphide production. R. P. TITTSLER and L. A. SANDHOLZER (Amer. J. Publ. Health, 1937, 27, 1240—1242).—Intense blackening was given in a shorter incubation time by organisms producing H_2S in peptone–Fe agar, as compared with a brownish-black colour developed in Pb acetate-agar. The former medium is preferred.

Filling device for bacteriological media. W. HICKSON (J. Inst. Brew., 1938, 44, 50–52).—The apparatus described is intended for the transfer of sterile liquified media (e.g., agar media) to tubes etc. under aseptic conditions. A modification gives rapid and clean filling when the preservation of aseptic conditions is not sought. I. A. P.

Application of sintered glass filters to bacteriological work. H. E. MORTON and E. J. CZARNETZKY (J. Bact., 1937, 34, 461—464).—Jena glass filters of porosity "5 auf 3" retain bacteria. A. G. P.

Sensitisation and antibody formation after injection of tubercle bacilli and paraffin oil. J. FREUND, J. CASALS, and E. P. HOSMER (Proc. Soc. Exp. Biol. Med., 1937, 37, 509—513).—The addition of paraffin oil to killed tubercle bacilli increases sensitisation and antibody formation in both guineapigs and rabbits. In rabbits such a prep. is more effective than BCG, and in guinea-pigs sensitisation and antibody are still present after 20 months. V. J. W. Bacterium melaninogenicum : demonstration of fibrinolysin, pathogenicity, and serological types. C. WEISS (Proc. Soc. Exp. Biol. Med., 1937, 37, 473—476).—Two pure strains were examined, one from a human subject with pyorrhœa and one from a monkey with a pulmonary abscess. Both strains caused inflammatory reactions in mice, dogs, and rabbits. The second strain showed more fibrinolytic power than the first and the bacterial proteins extracted from the two strains were found to differ in their immunological reactions though both were antigenic, when given intravenously to rabbits, and non-toxic to mice. V. J. W.

Mechanism of the precipitin reaction. I. Behaviour of immune precipitate towards washing. B. F. CHOW, H. WU, and K. LEE (Proc. Soc. Exp. Biol. Med., 1937, 37, 460—462).—Type 1 pneumococcal polysaccharide is added to horse or rabbit antiserum and incubated for $\frac{1}{2}$ hr. When the ppt. is washed with 0.85% NaCl the polysaccharide is found in the washings from the immune-rabbit ppt. and remains in the ppt. when immune-horse serum is used. V. J. W.

Fractionation of antibody in type 1 antipneumococcal serum by addition of ammonium sulphate. K. LEE, B. F. CHOW, and H. WU (Proc. Soc. Exp. Biol. Med., 1937, 37, 462—465).—When successive additions of saturated $(NH_4)_2SO_4$ are made to rabbit antiserum the ppt. can be obtained in eight fractions which vary qualitatively in their reactions. Thus fraction 8 agglutinates pneumococci but fails to react with the polysaccharide, and fractions 5 and 6 give a ppt. with the original polysaccharide but not with the products of its hydrolysis by acid and alkali. V. J. W.

Determination of minute amounts of type 1 pneumococcal polysaccharide by the complement-fixation method. K. LEE and B. F. CHOW (Proc. Soc. Exp. Biol. Med., 1937, **37**, 458—460).— The polysaccharide is added to antipneumococcal rabbit serum in various dilutions and incubated for $\frac{1}{2}$ hr. After adding guinea-pig complement it is placed in ice overnight and next morning is brought to room temp. and hæmolysin and sheep-cell suspension are added. It is incubated for an hour and the results are compared with those given by a known concn. of the polysaccharide. V. J. W.

Pallidin of syphilitic serums. A. VERNES, R. BRICQ, and A. GAGER (Compt. rend., 1937, 205, 1473—1475; cf. A., 1937, III, 164).—Pallidin (isolation from syphilitic serum described) (if kept over NaOH in vac.) maintains for more than 6 months its property of conferring syphilitic properties on a non-syphilitic's serum. The prep. is sol. in water or dil. aq. NH₃ but not in 1% NaCl and is not pptd by HNO₃ except when the acid is diluted 3000-8000 times. An aq. solution of palladin is pptd. by trichloroacetic acid, (NH₄)₂SO₄, H₄Fe(CN)₆acetic acid, Tanret's solution, and phosphotungstic acid, but not by heat although it is inactivated at 55° . Pallidin gives protein tests. J. L. D.

Effect of ascorbic acid on staphylococcus toxin. P. MERCIER, (Compt. rend. Soc. Biol., 1938, **127**, 188—

W. L. D.

190).—Ascorbic acid inhibits hæmolysis by staphylococcus toxin but has no effect on its lethal properties. H. G. R.

Inactivation of toxic diphtheria filtrate by keten. H. GOLDIE (Compt. rend. Soc. Biol., 1937, 126, 974–977).—The decrease in toxicity is proportional to the no. of NH_2 -groups blocked and is more rapid than the decrease in the antigenic power, although it is not always possible to obtain a completely detoxicated antigen. H. G. R.

Effect of keten on diphtheria toxin purified by dialysis. H. GOLDIE (Compt. rend. Soc. Biol., 1937, 126, 977—980).—The rate of detoxication, which is increased if peptone is removed by dialysis, is proportional to the no. of NH₂-groups blocked. When the latter val. reaches 45%, the detoxication is a max. and above this the toxic and antigenic powers are completely lost. H. G. R.

Antigen- V_1 of typhoid bacilli. D. COMBIESCO, C. COMBIESCO, N. DUMITRESCO, and A. BADENSKI (Compt. rend. Soc. Biol., 1937, **126**, 1079—1081).— Antigen- V_1 is found most frequently in the recently isolated strains of the typhoid bacilli, but in some strains it can be preserved over a no. of years. Agglutinogen- V_1 is thermolabile and at 52° will not agglutinate a pure anti- V_1 serum. H. G. R.

Physico-chemical, biological, and serological properties of the sugar-lipin antigen of typhoid bacilli. D. COMBIESCO, C. COMBIESCO, and E. SORU (Compt. rend. Soc. Biol., 1937, **126**, 1081—1084).— A sugar-lipin complex pptd. by pure anti-O serum can be obtained from the V, V-W, and W strains of typhoid bacilli, whilst only the V form gives an antigen pptd. by pure anti- V_1 serum. The properties of the sugarlipin antigens from the three strains are described.

H. G. R.

Inactivation of sera by agitation and development of the anticomplementary power. L. NATTAN-LARRIER, L. GRIMARD-STEEG, and J. DUFOUR (Compt. rend. Soc. Biol., 1937, **126**, 1095—1098).— Anticomplementary power is developed by heating sera in which the alexin has been destroyed by agitation. H. G. R.

Auto-(cold-)agglutination. III. The "specific autoagglutinating substance." P. NEUDA (Z. Immunitätsforsch., 1937, 91, 302—311).— Theoretical discussion. B. C. J. G. K.

Action of disinfectants on bacterial "receptors." K. AOKI (Z. Immunitätsforsch., 1937, 91, 280—284).—Using mouse-typhoid bacilli the effect of heat (60°), 0.2% antiformin, 1.5% phenol, and 30% ethyl alcohol, for different times, on the destruction of the α - and β -sp. and -non-sp. "receptors" was studied, in agglutination, absorption, and immunisation experiments. Apparent contradictory results were traced to the presence of sol. "receptors," detached from the cells by the treatments but still maintaining their antigenic powers, which could then be more or less damaged by further treatment. In the sol. condition the "receptors" were able to cause agglutinin *in vitro*, but were able to cause disinfectant consists in rendering sol. the "receptors" concerned, whereby the organism dies.

B. C. J. G. K. The β -specific "receptors" of Aoki; new method of preparation. K. FUJITA (Z. Immunitätsforsch., 1937, 91, 298—301).—The β -sp. "receptors" (homologous co-agglutinins) of 9 different serological types of *Salmonella* bacilli were prepared by absorbing the raw original sera by homologous bacteria previously killed by suitable disinfectants (cf. preceding abstract). B. C. J. G. K.

Separation of four "receptors" (of mousetyphoid bacilli). K. AOKI (Z. Immunitätsforsch., 1937, 91, 404–408).—By suspending the washed bacteria (from 20 hr. agar cultures) in aq. NaCl at 60° for different lengths of time (10, 100, 160 min.) the β - and the α -sp. and -unsp. "receptors" can be obtained in a sol. form. By centrifuging and filtering through filter-candles, at each stage of the heating, the sol. substances could be separated, the remaining bacterial bodies containing only the β -unsp. "receptor." The α -receptors were toxic, the β receptors non-toxic when used for immunising rabbits. B. C. J. G. K.

Occurrence of isoagglutinin anti-M. V. FRIEDENREICH (Z. Immunitätsforsch., 1937, 91, 485– 493).—A baby of the ON-type had in his blood isoagglutinin anti-M though his mother's blood contained none. C. R. S.

Serological colloid structure, complement activity, and cold hæmolysis. H. SACHS (Z. Immunitätsforsch., 1937, 91, 328–340).—In parallel with the theory that complement function is initiated by a sp. covering of cell antigens by antibody globulins, there is the possibility that a similar globulin layer, forming a hydrophobe surface, might result from the The adsorption of non-sp. globulins on the cell. formation of such an adsorption layer is therefore not the result of sp. affinity, but is a function of the colloid structure of the serum. Cold may be among the factors affecting the ability of the globulins to react in the above way and might explain many forms of cold hæmolysis (or agglutination) without the necessity of postulating auto-antibodies. The theory is applied to the case of paroxysmal hæmoglobinuria. B. C. J. G. K.

Augmentation of the sensitivity of hæmolytic titration. M. LOURAU (Compt. rend. Soc. Biol., 1937, 126, 1143—1146).—A method with an error not greater than 1% is described. H. G. R.

Temperature influence in lecithin-serumlysis. P. NEUDA (Z. Immunitätsforsch., 1937, 91, 273– 280).—Lecithin-serumlysis is an hæmolysis of (sheep) erythrocytes which have been treated with subhæmolytic concess. of lecithin, by normal serum in the cold. The effect of temp. (0° and 37°) on (a) the hæmolytic effect of lecithin, (b) the lecithin treatment of the erythrocytes, (c) the serum factor, and (d) the inhibition of lysis by lecithin treatment of the serum was studied. The lytic effect at 0° is the greater because the serum factor is then not damaged.

B. C. J. G. K. Passively sensitising effect of precipitating antisera as a function of their precipitin titre

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(Uhlenhuth), their zone of combination, and their dilution titre (Ogata). Z. TEVELI (Z. Immunitätsforsch., 1937, 91, 446—456).—These three factors are parallel in their effects as was shown by experiments with passively sensitised guinea-pigs. One antiserum, however, showed anomalous behaviour. C. R. S.

Excretion by mammals of substances of blood groups, especially of partial antigens of group B. P. DAHR and H. LINDAU (Z. Immunitätsforsch., 1937, 91, 470—484).—Group substances A or B are found in the secretions as well as in the blood of some animals. In other animals of the type B, this B differed in its partial antigens as between blood and secretions. C. R. S.

(w) PLANT PHYSIOLOGY.

Relation between oxidation and hydrolysis in a living cell. B. A. RUBIN and E. V. ARCICHOV-SKAJA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 17, 135-138).—The synthesis/hydrolysis ratio of sucrose in cabbage leaves was higher in an atm. of $\rm N_2$ and lower in $\rm O_2$ than in air. The ratio was increased by infiltration into the leaves of dehydroascorbic acid and to a smaller extent by ascorbic acid if this infiltration was carried out prior to that of sugar. Simultaneous infiltration of ascorbic acid and sugar depressed the activity of the enzyme system, synthesis being more markedly affected. Ascorbic acid stimulates synthesis only after oxidation to the dehydro-acid. High synthetic activity is associated with high oxidising intensity and with high proportions of sucrose in the total sol. sugars present in the cell. A. G. P.

Effect of auxins on protoplasmic streaming. K. V. THIMANN and B. M. SWEENEY (J. Gen. Physiol., 1937, 21, 123-135).-The action of auxin on growth is exerted on the cell contents and not on the cell wall. β -Indolylacetic acid, in concess. up to 0.5 mg. per l., causes increases in the rate of protoplasmic streaming of the epidermal cells of Avena coleoptiles; in concns. above 0.5 mg. per l., this auxin inhibits streaming. Similar but less intense effects are observed with the less active auxins, 3-coumarylacetic acid and allocinnamic acid. The effects are not due to changes in $p_{\rm H}$, nor can they be induced by treatment with ethylene chlorohydrin, histidine, or urea. The curve of effect against concn. parallels that for growth, although the concn. vals. differ. The effect of auxins on protoplasmic streaming is probably an early stage of their effect on growth.

A. E. W.

Transverse electric impedance of Nitella. H. J. CURTIS and R. S. COLE (J. Gen. Physiol., 1937, 21, 189–201).—A.c. measurements were made on single cells of Nitella, over a range of 30–2,500,000 cycles per sec., the direction of current flow being perpendicular to the axis of the cell. The cellulose wall of the cell has ρ approx. 1000 Ω , a val. independent of the medium in which the cell is placed. The cell membrane is probably nonconducting, and has a capacity of 0.94 µF. per sq. cm. and a phase angle of 80°. A. E. W. Plant growth in relation to wave-length balance. E. S. JOHNSTON (Smithsonian Misc. Coll., 1938, 97, No. 2, 1—18).—Growth of plants placed at varying distances from two light sources, one rich in blue and one in red rays, is examined. Large proportions of near infra-red rays induced yellowing of leaves, the effect being partly counteracted by increasing the N supply of the nutrient. Effects of varying intensity of red and blue light are recorded.

A. G. P.

Physiological antagonism of ions: toxic properties of pure nutrient salts. A. A. DROBKOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 17, 227-229).—Pea plants were grown with portions of their root systems in each of 4 separate solutions containing $Ca(NO_3)_2$, $KH_2PO_4 + KCl$, $MgSO_4$, and Fe and trace elements respectively. Growth up to the flowering stage was as good as when the whole roots were placed in a mixed nutrient solution. Inferior growth in the former plants after flowering resulted from inability of roots to develop except in the $Ca(NO_3)_2$ solution. Addition of $Ca(HCO_3)_2$ to each of the 4 separate nutrients permitted root and top growth equal to that in the single (mixed) nutrient solution. Physiological antagonism of nutrients is not due to toxic effects of individual nutrients but to relative insufficiency of one or more elements essential for a particular function in plant development.

A. G. P.

Specific permeability of different kinds of cells of the same plant. K. Höfler (Ber. deut. bot. Ges., 1937, 55, 133—148).—Differences in permeability to various solutes of different types of cells and of the plasma are examined. A. G. P.

Stomatal movement and epidermal water content. D. THODAY (Nature, 1938, 141, 164).— Epidermal water content, not that of the leaf as a whole, is the factor directly affecting stomatal movement in certain succulent plants. This may explain the marked sensitiveness of the coffee plant to insolation (Nutman, A., 1938, III, 83).

L. S. T.

Osmotic effects of deuterium oxide on living cells. S. C. BROOKS (Science, 1937, 86, 497–498).— D_2O acts as a plasmolytic agent in *Nitella clavata*, although plasmolysis is concealed by the elastic cell wall which follows the shrinkage. Water produces swelling of the cell. Erythrocytes from defibrinated sheep blood swell on return to aq. NaCl solution from an equally conc. D_2O -NaCl solution, thus causing hæmolysis. L. S. T.

Osmotic pressure and hydrogen-ion concentration of seaweeds in relation to those of seawater. R. E. COOPER and S. A. PASHA (J Indian Bot. Soc., 1935, 14, 237—255).—The $p_{\rm H}$ of sea-water averaged 8.31 and that of the cell sap of all algal species examined was between 6.6 and 7.0. The osmotic pressure of the water was 24.6—25 and in cells of Ulva lactuca, L., 36.2 atm. CH. ABS. (p)

Periods of absorption of nutrient substances by the sunflower plant in connexion with supplementary feeding. T. T. DEMIDENKO and V. P. POPOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 17, 59-62).—Sunflower plants accumulated N largely in the periods preceding and following head formation and responded more effectively to N fertilisers applied at that time. P and K are accumulated steadily between germination and head formation.

A. G. P.

Influence of radioactive elements uranium, radium, thorium, and actinium on the yield of plants. A. A. DROBKOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, **17**, 229–232).—The radioactive elements are regarded as essential plant nutrients rather than stimulants or catalysts. They cannot be used as substitutes for any other elements, and cannot be replaced in plant nutrition by K.

A. G. P.

Culture of a Schizophyceæ, Phormidium uncinatum, Gom. L. DELARGE (Arch. Inst. Bot. [Rec. trav.], 1937, No. 4, 38 pp.).—Growth of the alga produces alkalinity in a modified Detmer and in Molisch media, at rates which increase with rapidity of growth. Benecke's medium becomes more acid. Absence of Ca from the nutrient inhibits growth and induces chlorosis. Optimum growth occurred in artificial light of moderate intensity. Resistance to injury by chemical and physical agencies is attributable to the presence of the mucilaginous envelope.

A. G. P.

Absorption of mineral ions by plants : xerophytism and absorption of bromide by Vaccinium ulignosum and Empetrum nigrum, L. P. PREVOT (Arch. Inst. Bot. [Rec. trav.], 1937, No. 9, 13 pp.).—The corky layer covering the roots of the plants in June retards absorption of water. In October numerous non-corky roots are present. Leaves of plants in nutrients containing KBr accumulate considerable amounts of Br'. In V. ulignosum, absorption of Br continues unchecked after growth has ceased; in E. nigrum accumulation of Br' is greater in July than in October. Translocation of Br' within the plants is controlled by the intensity of transpiration. A. G. P.

Effect of transpiration on absorption [by plants] of mineral salts. R. O. FREELAND (Amer. J. Bot., 1937, 24, 373—374).—An increase in the water absorption of plants is accompanied by an increase in mineral intake, different ions being absorbed at different rates, and the rate for each ion varying with the plant used. A. G. P.

Variability of the constant K in the Robertson [growth] formula. N. T. DELEANO and I. D. VLADESCU (Bull. Soc. Chim. biol., 1937, 19, 1498—1520).—The growth const. K in the formula of Robertson, $\log x/(A-x) = K(t-t_1)$, whilst remaining fixed in the case of plants growing under the same conditions throughout their life, is variable when the plants are transplanted into the field at different times. With 7 lots of *Nicotiana tabacum* planted at regular intervals during the season, K increased to a max. and then decreased. A corresponding max. in the rate of growth and min. in the time required to reach a fixed height were observed. A. L.

Physiological ontogeny in plants and its relation to nutrition. A. H. K. PETRIE (Austral. J. Exp. Biol., 1937, 15, 385–404).—The effect of NO_3' supply on the protein-N, sol. N, total P, and water

content of the leaves of wheat and Sudan grass was examined. The abs. contents of these constituents rise to max. earlier than the max. dry wt. and fall markedly during the latter part of the growing period. The abs. contents at first tend to be depressed by NO_3 treatment, but later are increased, even in the case of P, which was present in the same initial amount in all treatments. The % amounts, on a dry wt. basis, have early max. and decline throughout practically the whole growing period. Treatment effects are at first inappreciable but later the contents of protein, sol. N, and water increase. The initial depression in dry wt. produced by high N treatment may be caused by temporary reduction in water content of the plant, leading to reduced protein content of the leaves and a temporarily reduced unit leaf rate. Possible factors affecting the rates of import and export of N and P by the leaves are: (1) external concn.; (2) rate of growth of leaves; (3) rate of growth of other parts and the nature of their development; (4) capacity of root system for intake; (5) rate of C assimilation; (6) internal changes in the leaves leading to decrease in net rate of protein synthesis; (7) establishment of a state of starvation with respect to some nutrient other than N. The relation of the water content of the leaves to their protein-N content is also discussed.

D. M. N.

Influence of nutrition on the frequency of mutation of Antirrhinum majus. H. DÖRING (Ber. deut. bot. Ges., 1937, 55, 167–182).—Mutation of normal plants grown in synthetic media is approx. as frequent as in those grown in soil but is accelerated by nutritional disturbances, e.g., deficiency of essential nutrients or unfavourable $p_{\rm H}$. A. G. P.

Organic nutrition of euglena, Astasia quartana (Moroff). L. PROVASOLI (Compt. rend. Soc. Biol., 1938, 127, 51—53).—The effects of the addition of various fatty acids to a peptone medium on the growth of euglena are described. H. G. R.

Organic nutrition of Euglena. L. PROVASOLI (Compt. rend. Soc. Biol., 1938, 127, 190-192).—The assimilation of different fatty acids by *E. gracilis*, *Astasia Chattoni*, and *A. quartana* is tabulated.

H. G. R. Chemical composition of Triticum, Egilops, and of their hybrids. E. MIÈGE (Compt. rend., 1937, 205, 928—929).—Varieties of Egilops, Haynaldia, and Triticum are compared with the hybrids of Triticum (\mathcal{J}) with \mathcal{E} . ovata and nigra (\mathcal{Q}) as regards the constituents of their seeds. The ash, N, and starch contents of "wild" varieties are higher than those of cultivated wheat, whereas the sugar content

those of curtivated wheat, whereas the sugar content is lower. The chemical composition of the seeds of $\mathcal{E}gilops$ is a dominant factor for the F3 and F4 generations of hybrids, but the exact composition depends on the variety of *Triticum* crossed.

J. L. D. Disulphide from ammonium sulphate in the presence of mashed root-tips of *Phaseolus vulgaris.* F. S. HAMMETT and A. REYNOLDS (Science, 1937, 86, 498-499).—The experiments described indicate that these root-tips contain an enzyme capable of reducing SO_4'' to $\cdot S \cdot S \cdot$. L. S. T. Fixation of hydrocyanic acid in some plants. V. PLOUVIER (Compt. rend., 1937, 205, 749-751).— Boiling water, alcohol, or acetone extracts of the leaves of cherry-bay contain different amounts of HCN with equimol. proportions of benzaldehyde because of hydrolysis by enzymes, which are not immediately inactivated by the boiling solvents, of amygdonitrile glucoside. The higher is the temp. of extraction the less is the amount of HCN extracted. Different plants contain different amounts of enzyme and hence yield varying amounts of HCN in aq. extracts. HCN in the extract/total HCN is a measure of the enzyme concn. in the plant. J. L. D.

Temperature and starch-sugar change in sweet potatoes. E. F. HOPKINS and J. K. PHILLIPS (Science, 1937, 86, 523-525).—Changes in the amounts of sucrose are recorded and discussed for cured and uncured roots of the sweet potato maintained in const.-temp. rooms at 55°, 60°, 65°, and 70° F., and are regarded as measuring the ratio of starch degradation at these temp. With respect to starch conversion the sweet potato is intermediate between the banana and the Irish potato. L. S. T.

Flowers as the centre of afflux of sugars. R. COMBES (Compt. rend. Soc. Biol., 1938, 127, 210— 212).—The corolla of *Enothera biennis*, *Verbascum thapsus*, and *Dahlia* contain large quantities (25%) of reducing sugars and small quantities (1-4%) of holosides and heterosides. H. G. R.

Alteration of membrane substances in higher plants, with special reference to lignification. I. Practical methods of analysis of principal membrane substances and a critical study of methods of quantitative comparison. T. FUJITA (Bul. Sci. Fak. Terkult., Kjusu Imp. Univ., 1935, 6, 387–403). —A comparison of the Koketsu "powder method" and other methods of determining the composition of plant membrane substances. CH. ABS. (e)

Inheritance of nicotine and anabasine in interspecific hybrids of Nicotiana glauca, Gr. M. F. TERNOVSKI, M. I. CHMURA, and N. I. ZUKOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 17, 43–45).— Hybrids of N. tabacum (0.85% nicotine) with N. glauca (0.6% anabasine) contain no nicotine but 0.55-1.28% of anabasine) contain no nicotine but 0.55-1.28% of anabasine. Hybrids of N. glauca $\times N$. rustica and triple hybrids of these and N. sylvestris show a general tendency towards an increase in anabasine at the expense of nicotine in comparison with the parent plants. A. G. P.

Submicroscopic morphology of the cell wall. A. FREY-WYSSLING (Ber. deut. bot. Ges., 1937, 55, 119—132).—The submicroscopic structure of plant cell membranes and the mechanism of cell extension are discussed. A. G. P.

Carbon dioxide assimilation and nitrogen economy [of plants] with progressive additions of potassium. F. ALTEN, G. GOEZE, and H. FISCHER (Bodenk. Pflanzenernähr., 1937, 5, 259– 289).—The K content of leaves and the rate of CO₂ assimilation increase with the amount of K supplied in ranges up to the optimum. In plants which are older but still retain full functional activity the relative response to K is smaller. The efficiency of K dosages is dependent on the level of supply of N and P. The ratio of protein-N to sol. N increases with the K supply to a sustained optimum which is reached when moderate levels of K are given. The protein per unit leaf area remains practically const. and sol. N diminishes as the K dosage is increased. Transpiration increases with K supply, the increase per unit dry matter produced in leaves being relatively greater when lower levels of K are given. The water-sparing effect of K is related to its beneficial effect on the functional efficiency of the leaves. The chlorophyll content of leaves increases with the K supply, reaching optimum with moderate K dosage and being unchanged when the amount of K is further increased. Variations of these effects with the age of the plant are examined. A. G. P.

Effect of species of host plant on nitrogen fixation in Melilotus. P. W. WILSON, J. C. BUR-TON, and V. S. BOND (J. Agric. Res., 1937, 55, 619— 628).—The efficiency of N fixation by different strains of *Rhizobium* associated with different species of Melilotus is examined. The strain of organism and species of host and also the physiological condition of the latter are important factors. The efficiency of a particular strain of *Rhizobium* is not an abs. characteristic. A. G. P.

Assimilation by plants of various forms of nitrogen. W. J. ROBBINS (Amer. J. Bot., 1937, 24, 243—250).—A classification of plants into 4 groups is suggested, viz., (i) N-fixing organisms utilising free N_2 , NH_4^+ , NO_3^+ , and org. N, (ii) $NO_3^--NH_4^+$ organisms assimilating NH_4^+ , NO_3^+ , org. N, but not N_2 , (iii) NH_4^+ organisms using NH_4^+ and org. N but not NO_3^+ or N_2 , and (iv) org. N organisms capable of utilising only org. N. Ability to utilise different forms of N is probably related to oxidation-reduction potentials in the cells. Aspergillus niger (type ii) exhibits greater reducing power than *Rhizopus nigricans* (type iii). A. G. P.

Assimilation of atmospheric nitrogen by germinating peas. V. SADASIVAN and A. SREENI-VASAN (Current Sci., 1937, 6, 216—217).—Germination of pea seeds in distilled water resulted in removal of N_2 from the air. During successive periods of germination there is a progressive increase in assimilation of N. When seeds treated with HgCl₂ were crushed under sterile conditions and plated on N-free media no colonies developed. Such seeds could grow without any nodulation in N-free nutrients. The germinating seed, independent of any other organism, fixes N. J. N. A.

Numerical and morphological modification of chromosomes induced in plants by the action of colchicine. P. GAVAUDAN and N. GAVAUDAN (Compt. rend. Soc. Biol., 1937, **126**, 985–988).— The effect of dil. solutions of colchicine on the plant nucleus during growth is closely related to that of X-rays. H. G. R.

Vitamin-C in germinating seeds. K. L. Povo-LOCKAJA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 17, 35-38).—The rate of production of vitamin-C during seed germination is greater in legumes than in cereals and diminishes with increasing age of seeds in parallel with the loss of germinating power. Cotyledons in legumes produce -C even if the plumule is removed; the endosperm is unable to synthesise -C. The developing root and shoot withdraw -Cfrom cotyledons during the first few days of germination. Respiratory activity of germinating seeds is related to the -C accumulation. The O₂ consumption of the ascorbic acid-ascorbase system fully accounts for that of the whole germinating seed. A. G. P.

Respiratory complex of resting seeds. Dehydrogenases and co-enzyme of Pisum sativum. D. BACH (Compt. rend. Soc. Biol., 1938, **127**, 175— 177).—Fumarase, and succinic-, malic-, formic-, and lactic-dehydrogenases were demonstrated in Pisum sativum. Systems activating alcohols, amino-acids, and glycerophosphoric acids were less evident whilst systems activating allyl and cinnamyl alcohols were observed for the first time in a plant organism.

H. G. R.

Mechanism of photosynthesis. L. G. M. BAAS-BECKING and E. A. HANSON (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 752—755).—A theory of the mechanism is based on the assumed existence of a constellation of four chlorophyll mols. (each with four active H in the same plane) in which the four cyclopentanone rings point to the same centre, viz., that in which CO_2 is reduced. Orthocarbonic acid rather than H_2CO_3 forms the raw material of photosynthesis. The Blackman reaction occurs prior to the photo-reaction and consists of the hydration of CO_2 . A. G. P.

Influence of magnesium on the relation between chlorophyll content and rate of photosynthesis. J. C. VAN HILLE (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 792-796).--The observations of Schleischer (A., 1935, 794) are not confirmed. The rate of photosynthesis of Chlorella pyrenoidosa and C. vulgaris, var. viridis, diminished with the age of the culture (after 4 days) and was not related to the chlorophyll content. The rate of diminution in photosynthesis per unit chlorophyll became greater as the supply of Mg was curtailed. In the first 4 days of growth the photosynthesis/chlorophyll ratio was fairly const. and the Mg content of the substrate had little influence on development. Subsequently growth increased with the proportion of Mg available. In older cultures the Blackman reaction probably limits photosynthesis. The rate of the Blackman reaction and the decomp. of H₂O₂ by the cultures were affected by changes of nutrient conditions in entirely different ways. A. G. P.

Induction period in photosynthesis. E. L. SMITH (J. Gen. Physiol., 1937, 21, 151-163).— Measurements of photosynthesis in fronds of *Cabomba* caroliniana show an induction period at high and low light intensities and $[CO_2]$. The equation most adequately describing these data also fits the results of other investigators on different species, and the process is shown to be similar in representatives of three phyla. A derivation of the equation for the induction data is made from a consideration of the photochemical cycle of photosynthesis, and its implications are discussed. A. E. W.

Photochemical production of oxygen from isolated chlorophyll granules. H. KAUTSKX (Naturwiss., 1938, 26, 14).—Results of Hill (A., 1937, III, 285) on the evolution of O_2 by the irradiation of isolated chlorophyll granules in the presence of K Fe^{III} oxalate are discussed. W. O. K.

Does a chlorophyll-containing tissue contain more ascorbic acid than the same tissue deprived of chlorophyll? L. RANDOIN, A. GIROUD, and A. RAKOTO-RATSIMAMANGA (Compt. rend. Soc. Biol., 1937, 126, 1068—1070).—Etiolated dandelion leaves contain less ascorbic acid than the green leaves.

H. G. R.

Plant growth hormones. F. Kögl (Chem. and Ind., 1938, 49—54).—A lecture. A. G. P.

Influence of auxin on secondary branching in two species of aster. A. L. DELISLE (Amer. J. Bot., 1937, 24, 159-167).-Development of lateral buds in A. novæ-angliæ and A. multiflorus following decapitation of shoots is inhibited by application of indolyl-3-acetic acid to the cut ends, the effect being approx. proportional to the concn. applied. Enhanced lateral branching of decapitated shoots resulting from removal of young leaves immediately below the terminal bud is similarly inhibited. The auxin content of tips of shoots below the terminal bud decreases rapidly from the tip downward; that of leaves is inversely proportional to age and size. The branching habit of the plants is closely related to the amount of auxin formed in the terminal bud and to a smaller extent to that produced in young leaves.

A. G. P.

Effect of heteroauxin on the rooting of cuttings from subtropical wood. M. M. GOTSCHOLASCHVILI and N. A. MAXIMOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 17, 51—54).—Improved rooting of cuttings treated with heteroauxin is more marked in leafy than in leafless cuttings, and is greater in spring, when physiological activity is high, than in autumn. Substances elaborated in leaves are important factors in rooting response. A. G. P.

Influence of heteroauxin on root formation in perennial plants. R. C. TRURECKAJA (Compt. rend. Acad. Sci. U.R.S.S., 1937, **17**, 143—145).— Heteroauxin increased the no. of roots formed, their strength, and the rate of their formation on orange, lemon, and feroja cuttings. A. G. P.

Is heteroauxin a growth-promoting substance? L. H. LEONIAN and V. G. LILLY (Amer. J. Bot., 1937, 24, 135—139).—Growth of fungi, algæ, and detached roots and shoots of maize was not stimulated by small concns. of heteroauxin in the nutrient medium. Larger concns. (up to 1 in 10,000) were injurious.

A. G. P. Physiological curve of response to phytohormones by seeds, growing plants, cuttings, and lower plant forms. N. H. GRACE (Canad. J. Res., 1937, 15, C, 538-546).—The response of cuttings etc. to indolyl-acetic, -propionic, and -butyric, and naphthylacetic acids increased with the dosage to a max. beyond which injurious effects were apparent. Seeds treated with dusts impregnated with hormone produced increased growth of roots and tops, the injurious effect of overdosage being less marked than when the hormones were applied in aq. solution. Application of hormones in very dil. solution at the rate of 50—250 mg. per acre stimulated growth of young lettuce and tomato plants. Treatment of cuttings with impregnated dust improved rooting. The hormones stimulate fermentation of sugar by yeast. A. G. P.

Significance of growth-substance in growth and geotropism of roots. H. U. AMLONG (Ber. deut. bot. Ges., 1937, 55, 183—186).—Application of small concess. of heteroauxin to decapitated roots poor in growth substances causes negative bending and stimulation of growth. Heteroauxin and its Na salt produce similar effects. Recorded differences in the effects of heteroauxin on roots and shoots result from differences of susceptibility to the action of the growth substance, rather than to qual. differences in action, *i.e.*, optimum positive effects are produced by different levels of concen. in the two cases. This is related to the effect of different concess. of heteroauxin on the turgidity of cells. A. G. P.

Changes in seedlings after a short treatment with a solution of β -indolylacetic acid. T. SOLACOLU and D. CONSTANTINESCO (Compt. rend., 1937, 205, 1002—1004).—Immersion of the roots and stem of pea, bean, and Vicia faba seedlings in 0.2% aq. β -indolylacetic acid for 15 min. followed by washing and replacement in water causes splitting of the rootbark and development of numerous new roots in 48 hr. With gourds, the stem becomes thickened and 3 or 4 days later roots develop from the thickened areas. Treatments exceeding 15 min. kill the plant. J. D. R.

Action of carotene as an activator of root initiation in *Impatiens balsamina*, L. O. LAZAR (Arch. Inst. Bot. [Rec. trav.], 1937, No. 6, 53 pp.).— Treatment of seedlings with carotene during germination in darkness had no definite influence on subsequent development. Removal of main roots induces secondary root formation, which is accelerated by carotene. Carotene functions as an O₂ carrier under these conditions. A. G. P.

Avena coleoptile curvature in relation to different concentrations of certain synthetic substances. G. S. AVERY, jun., P. R. BURKHOLDER, and H. B. CREIGHTON (Amer. J. Bot., 1937, 24, 226— 232).—Curvatures caused by methyl and K 3-indolylacetates, γ -3-indolylbutyric acid and its methyl ester and K salt, α -naphthylacetic acid, its K salt and methyl and ethyl esters, and β -3-indolylpropionic acid and its K salt, in general were proportional to the conens. applied but were not related to the [H']. 3-Indolyl-acetic and -butyric acid were the most active, the K salts being more effective than the free acids. Transverse movement of the growth substances in the coleoptile tends to diminish the curvature.

A. G. P.

Growth-substance determinations. S. GRA-NICK and H. W. DUNHAM (Science, 1938, 87, 47).— The method described depends on the fact that growth practically ceases when etiolated seedlings of Lupinus albus, decapitated below the cotyledons, are exposed to light, and that elongation of the hypocotyl occurs in light when a growth substance is applied to its cut surface. Elongation is proportional to concn. of the growth substance. The method can be used for the detection of hormones at the low concns. to which the Avena coleoptile responds. L. S. T.

Determination of auxins. P. E. SIMOLA, H. WÄRE, and K. KANNISTO (Suomen Kem., 1937, 10, B, 36).—Auxins are determined by their inhibitory action on the growth of lupin seedling roots.

M. H. M. A.

Effects of microbial bacteriorhiza complexes on root formation in different plants. A. A. ISAKOVA [(Compt. rend. Acad. Sci. U.R.S.S., 1937, 17, 147—149).—The bacteriorhiza of plants accumulates growth hormones which stimulate root development. In the absence of plant roots soil bacteria do not exhibit this property. A. G. P.

Effect of bacteriorhizal complexes on development of sugar beet. A. A. ISAKOVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 17, 150—152).—Treatment of seed with *Azotobacter* cultures and/or bacteriorhiza of sugar beet or pea increased the yield of beet. The effect was enhanced by supplementary application of the bacterial preps. to growing plants. The action of *Azotobacter* is ascribed to the accumulation of plant hormones rather than to the fixation of N. A. G. P.

Acceleration of growth of seedlings and accumulation of blastinin in endosperm through yarovisation of spring and winter wheats. A. SEREISKI and M. SLUDSKAJA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 17, 55—58).—The effect of yarovisation is associated with the production or activation of growth-promoting substance (coleoptile test) in the endosperm. A. G. P.

Relationship between virus infection and metabolic physiology with plant viruses. G. A. KAUSCHE (Biochem. Z., 1937, 294, 365—371).—The buffering power of the press-juice of tobacco leaves inoculated with mixed potato mosaic virus is greater than that of the juice of healthy leaves. The virus also affects the oxidation-reduction potential of the juice. In healthy and infected leaves, the potential remains at a const. level. W. McC.

(x) PLANT CONSTITUENTS.

Determination of phosphoric acid in plant material. R. E. SHAPTER (J. Proc. Austral. Chem. Inst., 1937, 4, 413–425).—Destruction of org. matter by $\text{HClO}_4 + \text{HNO}_3$ is faster than with $\text{HNO}_3 +$ H_2SO_4 , and the factor for determination of P_2O_5 by Pemberton's method remains const. over a wider range. J. S. A.

Rapid determination of chlorine in plants. A. G. SCHESTAKOV and A. P. KASCHEEV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 17, 39–41).—The dried material is digested, on a water-bath, with HNO_3 -AgNO₃. Excess of Ag in the filtered liquid is titrated with NH₄CNS. A. G. P.

Determination of sulphur in plants. R. BALKS and O. WEHRMANN (Bodenk. Pflanzenernähr., 1937,

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6, 48—56).—Plant material is heated with 10% aq. NaOH, cooled, and treated with H_2O_2 . The residue is dried and digested with HNO_3 -HClO₄, and after removal of SiO₂, the SO₄" is determined as BaSO₄. Vals. thus obtained for various crop plants are approx. double those found by ash analysis, and considerably higher than those obtained after ignition with alkali. A. G. P.

Determination of total sulphur in plant material. E. BLANCK, R. MELVILLE, and J. SACHSE (Bodenk. Pflanzenernähr., 1937, 6, 56—64).—Ashing plant matter without addition of alkali leads to considerable loss of S. In presence of alkali ashing of wet or of air-dried material yields the same val. for S, but use of oven-dried (80—100°) samples results in low vals. Digestion of material with HNO_3 - $HCIO_4$, with HNO_3 -HCI- $KCIO_3$, or with NaOH- H_2O_2 -Br (cold) yields the same val. for S. In pptg. SO_4'' with $BaCl_2$, excessive proportions of $BaCl_2$ or dissolved salts causes positive errors. Better results are obtained by pptg. SO_4'' as $SrSO_4$ in 50% alcohol (cold), washing the ppt. with alcohol, digesting with $(NH_4)CO_3$, and after removal of $SrCO_3$, pptg. SO_4'' as $BaSO_4$. A. G. P.

Determination of total sulphur content of plant material. A. RIPPEL and K. NABEL (Bodenk. Pflanzenernähr., 1937, 6, 64—69).—In determinations of S by digestion with fuming HNO_3 followed by fusion with KOH the accumulation of alkali salts introduces error in the subsequent pptn. as $BaSO_4$. The process yields theoretical vals. for mustard oil. With plant materials results vary with the extent and manner of drying, the degree of variation depending in the plant species concerned. A. G. P.

Determination of sulphur in plant and animal substances. H. STOTZ (Bodenk. Pflanzenernähr., 1937, 6, 69–93).—Fusion of the material with peroxide, with or without preliminary digestion with HNO_3 , may fail to convert all S into $SO_4^{\prime\prime}$. Ashing in presence of KOH and $KMnO_4$ effects complete oxidation. A. G. P.

Distribution of manganese and iron in Quebec conifers. P. RIOU, G. DELORME, and H. GAMELIN (Compt. rend., 1937, 205, 743—745; cf. A., 1936, 1035; 1937, III, 50).—Fe and Mn are determined in the bark, branches, leaves, sapwood, heartwood, and fruit of *Larix laricinia*, *Picea glauca*, *P. mariana*, *Juniperus communis*, *J. horizontalis*, and *Taxus canadensis*. A high Mn content is found in species which grow in humid situations and is associated with a low Fe content. The leaves are richest in Mn.

Biological rôle of micro-elements. R. WASICKY (Österr. Chem.-Ztg., 1938, 41, 1—8).—The distribution and significance of traces of Sn, Br, Cu, I, F, and other elements in the animal and vegetable organism are discussed. J. S. A.

Determination of formaldehyde in plants. G. POLLACCI (Boll. Soc. ital. Biol. sperim., 1937, 12, 692—694).—Leaves cut from plants after exposure to strong light were placed in a vessel which was then evacuated. Formaldehyde was detected (by the dimedon derivative) in the condensed water on the sides of the vessel and in aq. NH_3 (which formed hexamethylenetetramine) through which the evacuated air was drawn. The results confirm that formaldehyde is a product of photosynthesis.

F. O. H.

Chemical composition of maize coleoptiles. Y. NAKAMURA and K. HESS (Ber., 1938, 71, [B], 145-152).-The material is extracted with alcoholether, chloroform, and water. The portions sol. in water are ascribed to the cell interior and the insol. portions to the cell wall; the distribution of the fatwax portion is at present uncertain. The insol. portion contains much protein and relatively little polysaccharide of the glucose series. A small PO₄" content indicates that sparingly sol. phosphatides are present in the wall. The low content of polysaccharide is in harmony with the Röntgen diagram of the product in which the interferences of cellulose are not recognisable. The sol. portion contains considerable amounts of protein, mainly derived from the plasma, and surprisingly large quantities of polysaccharide. In harmony with conclusions based on a study of cotton hairs, this indicates the possibility that the precursors of polysaccharide must mainly be sought in the plasma. The high pentosan content of the insol. is matched by the low content of the sol. portion. The considerable $PO_4^{\prime\prime\prime}$ content of the sol. portion points to the presence of considerable amounts of phosphatides. Oat coleoptiles contain about 10% of fat-wax. It is improbable that the young cell walls are pure cellulose walls. H. W.

Oxalacetic acid in leguminous plants. A. I. VIRTANEN and T. LAINE (Suomen Kem., 1937, 10, B, 35).—Oxalacetic acid occurs in the pea plant, in agreement with the observation that the excised root nodules of leguminous plants will only fix N in presence of this acid. M. H. M. A.

Unstable ester of choline present in Lactarius blennius. A. OURY and Z. M. BACQ (Compt. rend. Soc. Biol., 1937, **126**, 1263—1264).—An unstable ester of choline (? acetylcholine) is present in the juice and probably the tissues of L. blennius.

H. G. R.

Constituents of the cannonball fruit (Couroupita guianensis, Aubl.). E. K. NELSON and D. H. WHEELER (J. Amer. Chem. Soc., 1937, 59, 2499— 2500).—The fruit of the cannonball tree from Puerto Rico contains a small amount of volatile oil (a mixture of phenols and acids), to which the characteristic odour is due, and a trace of a carotenoid pigment. The non-volatile acids are citric with smaller amounts of malic and *iso*citric acids. R. S. C.

Lachrymatory principle in the roots of Ranunculus Thora, L. A. GORIS (Compt. rend., 1937, 205, 624-626).—Steam distillation of the crushed roots affords a volatile lachrymatory and vesicant oil which soon loses these properties and affords an amorphous solid from which boiling COMe₂ extracts anemonin. Roots dried in air and extracted with ether give much anemonin and only a little of the oil. J. L. D.

Cyanogenetic glucosides in Australian plants. VI. Unstable cyanogenetic constituent in Goodia latifolia. H. FINNEMORE and D. K. LARGE

J. L. D.

(J. Proc. Roy. Soc. New South Wales, 1937, 70, 440—451).—Acetone extracts from the leaves a substance (acetyl derivative, m.p. 143°) which with emulsin yields an ether-sol. unstable cyanohydrin, hydrolysed to *p*-hydroxybenzaldehyde and glucose. The substance spontaneously evolves HCN, and is probably the cyanohydrin of the glucoside of *p*hydroxybenzaldehyde. A. LI.

Constituents of *Ceanothus Americanus*. Ceanothic acid.—See A., II, 108.

Carbohydrate constituents of bark of ash (Fraxinus excelsior). H. W. BUSTON and H. S. HOPF (Biochem. J., 1938, 32, 44—46).—Ash bark contains approx. 7% of pectic substances and 20% of hemicelluloses; in the hydrolysis products of the latter mannose, galactose, galacturonic acid, and arabinose have been identified. Hexosan units, especially galactans, are predominant. Xylose is the chief carbohydrate constituent of the hemicelluloses of the sap wood. J. N. A.

Lignin. K. FREUDENBERG (Papier-Fabr., 1938, 36, 34-36).—The structural formula for spruce lignin is given. By oxidation and methylation veratric, *iso*hemipinic, and dehydrodiveratric acids are obtained in a ratio which suggests that the lignin is built up largely from phenylpropane derivatives. Beech lignin is structurally more complicated than spruce lignin in that the nucleus contains an additional syringic acid mol. Lignin mols. are bound with a glucose link and, probably, hemicelluloses are bound similarly to the lignin. D. A. C.

Plant-phosphatides and lecithin. IV. Phosphatides of barley, wheat, and oats. W. DIE-MAIR, B. BLEYER, and W. SCHMIDT (Biochem. Z., 1937, 294, 353-364; cf. A., 1935, 421).-Barley, wheat, and oats contain 0.16, 0.12, and 0.14%, respectively, of carbohydrate-free phosphatides (monoamino-compounds of the choline-lecithin type; P:N ratio 1:1). In phosphatides of barley and wheat the α -form, in those of oats the β -form, of lecithin predominates. The fatty acids of the phosphatides are palmitic and stearic in barley, and palmitic, stearic, lauric, and myristic in wheat and oats. Linoleic and traces of oleic acid occur in the phosphatides of all three grains. The basic part of the phosphatides is choline (barley 12.8-13.9, wheat W. McC. 9.61 - 10.24, and oats 8.5 - 11.4%).

Comparative development of hordenine in barley during germination. Y. RAOUL (Ann. Ferm., 1937, 3, 385-405).-Hordenine is absent from barley seed, and after germination appears only in the rootlets at the points of intense cell division in amounts which increase in the earlier stages of germination, thereafter decreasing to zero. Tyrosine shows opposite variations, though its loss in the early stages of germination is not exactly compensated by hordenine formation. Hordenine behaviour is similar under field and under malting conditions. Formation of hordenine from tyrosine during germination is very probable. Germination in solutions containing tyrosine or tyramine but not in those containing hordenine gave a dark colour (tyrosinase reaction). The implications of this are discussed. I. A. P.

Proteins of Indian vegetables. Drumstick (Moringa pterygosperma). Y. V. S. RAU and V. RANGANATHAN (J. Indian Inst. Sci., 1937, 20, A, 49—54).—Air-dry material yields a prolamine of low amide-N and high basic N, containing 22.6% of its total N as arginine. A globulin and a trace of albumin are also present. J. L. C.

Sorption of carbon dioxide by chlorophyll.— See A., I, 134.

Colouring matters of fungi. III. Carotenoids of some species of Cantharellus. H. WILL-STAEDT (Svensk Kem. Tidskr., 1937, 49, 318–323; cf. A., 1935, 495; 1936, 856).—Cantharellus extracts have been analysed chromatographically. α - and β -Carotene, lycopene, and unidentified carotenoids have been found. M. H. M. A.

Sporopollenins from brown coals. XIV.—See A., I, 164.

Derivatives of cinchona alkaloids and their rôle is the formation of epimeric and heteromeric bases. E. LÉGER (J. Pharm. Chim., 1938, [viii], 27, 63-79).—A review.

Alkaloids of Cinchona leaves.-See B., 1938, 224.

Atisan for Aconitum heterophyllum, Wall, and anthorin from Aconitum anthora.—See A., II, 118.

Amanita toxins. IV.-See A., II, 66.

(y) APPARATUS AND ANALYTICAL METHODS.

Some errors in quantitative spectrophotometry. E. S. MILLER (Proc. Soc. Exp. Biol. Med., 1937, 37, 574—577).—The addition of 0.6% of butter to solutions of carotene causes errors in the spectrophotometry of the solution through the turbidity and consequent light-scattering produced. V. J. W.

Simple adaptation photometer. J. H. SHAXBY (J. Physiol., 1938, 91, 20-21P).—The apparatus enables progress of dark adaptation to be recorded. J. A. C.

Differential photometry : its application to the determination of carbon monoxide in blood. H. HARTMANN (Ergebn. Physiol., 1937, **39**, 413-449). —A method and an electric differential photometer for determining small amounts of CO (average error 0.1%) and hæmoglobin in blood are described. The results for hæmoglobin are slightly higher than those obtained by the method of Van Slyke and Hiller (A., 1928, 1149) but the max. variation (0.5%) in results of successive determinations with the same sample is smaller. W. McC.

High-precision calorimeter. H. WELSCH (Arch. Inst. Bot. [Rec. trav.], 1937, No. 10, 4 pp.).—Apparatus is described for the calorimetric determination of the water of inhibition of protoplasm. A. G. P.

Qualitative and quantitative micro-analysis of lipins in cells and tissues. A. HADJIOLOFF (Z. Zellforsch., 1937, 27, 528-533).—A general survey of the methods used in the micro-analysis of cell lipins. Optical and staining methods are discussed as well as methods involving the use of fat solvents. R. J. O'C.

Colorimetric series determinations with redox indicators in absence of oxygen. P. WELS (Arch. exp. Path. Pharm., 1937, 186, 428-433).—A method for the continuous determination of the progressive decolorisation of methylene-blue in experiments on oxidation is described. T. B. H.

Value of the Hagedorn-Jensen method for determining pentoses and other reducing sugars formed by hydrolysis of polysaccharides. L. M. GONZÁLEZ (J. Lab. clin. Med., 1937, 23, 280-283).—Monosaccharides subjected to acid hydrolysis for a period of more than 5 hr. undergo partial decomp. Hydrolysis of polysaccharides for more than 7 hr. results in the destruction of some of the reducing substances formed during the reaction. Hydrolysis for more than 5 hr. of pentose-yielding polysaccharides may result in the destruction of some of the hydrolysed products. The Hagedorn-Jensen method is satisfactory for determining substances of low reducing power. T. H. H.

Micro-determination of α -ketoglutaric acid. H. A. KREBS (Biochem. J., 1938, 32, 108—112).— The acid (not less than 0.2 mg.) in urine or blood is determined by conversion into the 2 : 4-dinitrophenylhydrazone, which is then oxidised to succinic acid by KMnO₄; the latter is then determined by means of succinic dehydrogenase. Serum from a case of polycythæmia vera contained 1.05 mg. and that from a case of cardiac decompensation 0.75 mg. of α ketoglutaric acid per 100 c.c., whilst 10 normal and pathological urines contained 10—40 mg. per 24-hr. specimen. P. G. M.

Determination of ascorbic acid in tissues. M. OGAWA (J. Agric. Chem. Soc. Japan, 1938, 14, 52-64).—The tissues are deproteinised by a mixture of HPO₃ and sulphosalicylic acid, and reduced and total ascorbic acid are determined separately in two portions of the filtrate. With pigmented extracts, a colorimetric method is used, as adsorbents remove not only the colour but also some of the ascorbic acid. J. N. A.

Determination of blood-sugar. S. SEILER (Biochem. Z., 1937, 294, 309–313).—Blood (2–3 c.c.) is deproteinised immediately after removal with Na_2WO_4 - H_2SO_4 , excess of Pavy's CuSO₄ solution is added, and the excess is titrated with 0.1% aq. glucose. A blank determination must be made. The results do not differ by more than 0.01% from those of the Hagedorn-Jensen method. W. McC.

Determination of starch in vegetable material and animal excrement. A. Hock (Biochem. Z., 1937, 294, 336—341).—The material is extracted with ether and treated with diastase, interfering substances being then pptd. with 60% aq. alcohol. The maltose is then hydrolysed with HCl, proteins are removed with phosphotungstic acid, and the reducing power of the solution is determined in the usual way. A blank determination in which heat-inactivated diastase is used is made. The error is approx, $\pm 1\%$. W. McC.

Cholesterol content of normal human plasma. VII. Macro-determination of cholesterol by digitonin: J. A. GARDNER, H. GAINSBOROUGH, and R. MURRAY (Biochem. J., 1938, **32**, 15–18).—A method is described in which errors due to incomplete extraction of cholesterol, esterification of free cholesterol in the extracted material, and loss of sterol during the extracted material, and loss of sterol during the extraction following saponification are avoided. An accuracy of $\pm 2\%$ is obtained in determining free and esterified cholesterol in 5–10 g. of plasma or serum. F. O. H.

Colour reaction of tannic acid.—See A., II, 120.

Analysis of renal calculi. J. KAMLET (J. Lab. clin. Med., 1937, 23, 321—322).—Details are given for a complete determination of the chemical constituents of a calculus using only 10 mg. of material. T. H. H.

Determination of total fixed base in tissue. C. T. SNELL and I. N. KUGELMASS (J. Lab. clin. Med., 1937, 23, 274—277).—The Stadie–Ross method was applied to the determination of total fixed base in tissue. The error of the method for 0.1 milliequiv. of total base is $\pm 1\%$. T. H. H.

Removal of iron in the determination of calcium in biological substances. J. ETTORI and R. GRANGAUD (Compt. rend. Soc. Biol., 1938, 127, 144—146).—The cupferron method is recommended. H. G. R.

Determination of iron in biological materials. Use of o-phenanthroline. F. C. HUMMEL and H. H. WILLARD (Ind. Eng. Chem. [Anal.], 1938, 10, 13—15).—Details of the determination of Fe in foods, fæces, and blood, using o-phenanthroline, are given. With 0.01 to 0.70 mg. of Fe, an accuracy of 3% is attained. Interference by $P_2O_7^{\prime\prime\prime\prime}$ is overcome by allowing sufficient time to elapse for the complete conversion of the Fe into the Fe^{•-}o-phenanthroline complex. None of the elements found in traces in biological materials, except more than 0.2 mg. of Cu or 0.6 mg. of Sn, interferes. L. S. T.

Biological Standardization. J. H. BURN (Humphrey Milford, Oxford University Press, 1937, pp. xviii + 286).—This book is the successor to "Methods of Biological Assay" by the same author; as the subject has grown greatly since 1928 the new book is much larger than the old one. After a general discussion, successive chapters are devoted to statistics, posterior pituitary, insulin, adrenal, thyroid, parathyroid, ovary, testes, anterior pituitary, vitamins-A, $-B_1$, -C, and -D, cardiac glucosides, ergot, org. arsenicals, and antimalarials. The methods used for the biological standardisation of all these preps. are described in very full detail, so that it should be possible to carry out all the tests without reference to any other publication. Immunological methods are, however, not discussed. The book is full of practical hints and should be widely read. Those actually engaged in biological assay will find it in-J. H. G. dispensible.