BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

A., III.—Physiology and Biochemistry

JANUARY, 1938.

Colour reactions after triple mordanting of phosphotungstic acid–alizarin–hæmatoxylin. A. CRETIN (Bull. Histol. Tech. micr., 1937, **14**, 165—167).—The fixative recommended is a mixture of 1 litre of methylated spirit at 50° with 40% of formol, saturated with picric acid, to which are added 3 g. of NaCl and 250 c.c. of 15% trichloroacetic acid in methylated spirit. Fixation lasts for 4 to 5 days. For decalcification a 5% solution of HCl in 15% NaCl is used. The triple mordant ($AlCl_3$, $FeCl_3$, and $CaCl_2$) is used on the sections for 36 hr.; the staining solution consists of hæmatoxylin with alizarinsulphonate to which is added phosphotungstic acid before use; staining is carried out for 1—24 hr. The identification of the histochemical constituents depends on the various colours provided by the different lakes. E. E. H.

Impregnation of nerve fibres with silver in bulk or in tissue cultures. J. SZEPSENWOL (Bull. Histol. Tech. micr., 1937, **14**, 168—176).—The success of Ag impregnation depends chiefly on fixation. The best fixing fluid contains 10% of formol and 4% of HCO_2H, and is used at 42—50°. For young larvæ and embryos that tend to swell in acid, preliminary fixation in cold 10% formol should precede the 10—20 days' fixation in the warm acid formol mixture. For tissue cultures 1—2 days' fixation is adequate. After fixing, the pieces are washed for 48 hr. before treatment with $AgNO_3$. Impregnation should be carried out in the dark at 33—35°, the pieces being put into 1% solution for 1—2 days, and then into 3% solution; treatment with $AgNO_3$ should be for 7—10 days for young embryos and small pieces, 2—3 weeks for large pieces, and 24 hr. for tissue cultures. The brown pieces are then washed quickly in distilled H_2O, and put into 10% ammoniacal $AgNO_3$ for 2—3 hr. for small, 4 hr. or more for large, pieces, and 20 min. for tissue cultures. After washing for 15 min. in distilled water, reduction is carried out in 20% neutral formol for 12—14 hr. After washing for 15 min. in distilled water, the pieces are embedded in paraffin through chloroform or cedar-wood oil. E. E. H.

Pseudo-phagocytosis by human bronchial epithelial cells. A. POLICARD (Bull. Histol. Tech. micr., 1937, **14**, 177—179).—In mineral pneumoconiosis the cells of the lung alveoli contain masses of mineral particles of external origin. The bronchial epithelial cells also contain particles, which are much smaller than those in the alveolar cells, and lie between nucleus and ciliated border. By micro-incineration they are shown to be ferruginous, giving a reddish-yellow ash in contrast with the characteristic white ash given in the dust cells of the lung. These granules are the products of activity within the epithelial cells, are not of external origin, and their presence does not indicate phagocytic activity on the the part of the epithelial cells. E. E. H.

Histology of organs of hypophysectomised mouse. C. P. LEBLOND and W. O. NELSON (Bull. Histol. Tech. micr., 1937, **14**, 181—204).—Only those animals were used in which serial sections of the sella turcica showed that hypophysectomy was complete. During the initial crit. period characterised by a high mortality rate and asthenia, there is degeneration of the zona reticularis of the adrenal cortex. After this period the animal can survive for a long time. There is marked atrophy of the adrenal cortex, thyroid epithelium, and genital apparatus in both male and female with the exception of very young ovarian follicles and spermatogonia; the interstitial tissue of the sex glands is invaded by plasmocytic cells. The maternal instinct persists, and pregnancy can occur. The degeneration of organs is due to atrophy of individual cells rather than to diminution in the no. of cells. E. E. H.

Investigation of mucous cells. R. G. BUSNEL (Bull. Histol. Tech. micr., 1937, **14**, 205—207).—Material is fixed in picro-formol and embedded in paraffin. Sections are taken down to distilled H_2O, left there for 10 min., and then treated with 0·5% toluidine-blue in distilled water, for 1—2 min. Sections are taken quickly through abs. alcohol, and mounted in xylol balsam: the treatment with alcohol must be rapid, as this decolorises the section. The section is dark blue, and the mucous cells appear violet. Cartilage is stained a pinkish-violet, nuclei dark blue, membranes lighter blue, and cytoplasm very pale blue: the cytoplasm of erythrocytes is emerald-green. E. E. H.

Secretory activity of the mesonephros of the 96-hour chick embryo as illustrated by the Golgi apparatus. V. VERMOOTEN (S. Afr. J. med. Sci., 1937, **2**, 1—6).—Serial sections of the mesonephros, fixed and stained by the da Fano procedure, show that the Golgi network in the glomeruli is undifferentiated; variation from this condition is observed further down the tubule, the greatest activity being in the cells just before the tubule joins the collecting vessel, where again the resting appearance is observed. The glomeruli are not vascularised but consist of masses of closely packed embryonal cells; the tubules, however, are long and tortuous with a well-developed lumen. R. M. M. O.

Mucous membrane of the cardio-œsophageal junction in the Bantu. J. GILLMAN (S. Afr. J. med. Sci., 1937, **2**, 18—28).—The main differences from the normal European type are: excessive thickness of the œsophageal epithelium, const. presence of deep mucous-secreting glands in the base of the œsophagus, narrowness of the region over which superficial cardiac glands are found below the junction, and great development of lymphatic tissue in scattered or aggregated masses. No distinction can be drawn between cardiac glands and superficial glands at the base of the œsophagus, which cover a variable extent. The deep glands are very const. in their structure, consisting of several branched and coiled tubules opening radially into central ducts, but their size is variable. R. M. M. O.

Histological examination of long strips of hollow viscera. H. B. STEIN (S. Afr. J. med. Sci., 1937, **2**, 117—120).—By rolling strips of tissue before fixation for histological examination it was possible to examine large areas of tissue on a minimal no. of slides. R. W. N.

The Berblinger-Burgdorf method of staining anterior pituitary. H. RODRÍGUEZ (Endokrinol., 1937, **19**, 151—160).—Berblinger and Burgdorf's method of staining the anterior pituitary (cresofuchsin, carmine, orange G, aniline-blue) is particularly suitable for demonstrating acidophile and basophile pituitary cells. Basophile cells are numerous in pig, sheep, horse, dog, and certain monkeys, few in cattle and rabbit. Basophile cells could not be demonstrated in calf, guinea-pig, and rat, but a few have been found in the pars intermedia of the pituitary in pig, cattle, sheep, horse, dog, and monkey. A. S.

Impregnation of reticulin fibres in paraffin sections. A. H. T. R. SMITH (J. Path. Bact., 1937, **45**, 312—313).—The Ag impregnation of reticulin fibres is simplified and rendered const. by taking the sections through the solutions unattached to slides but still impregnated with wax. C. E. B.

Silver impregnation of reticulum in paraffin sections. G. GÖMÖRI (Amer. J. Path., 1937, **13**, 993—1002).—A modification of the Bielschowsky-Maresch reticulum method is described. C. J. C. B.

Intranuclear inclusion bodies in the tissue reactions produced by injections of certain foreign substances. P. K. OLITSKY and C. G. HARFORD (Amer. J. Path., 1937, **13**, 729—748).—Intranuclear inclusion bodies closely resembling virus inclusion bodies were induced by subcutaneous injections into guinea-pigs of Al and Fe^{III} compounds and C (the last two preps. only with difficulty). $BaSO_4$, AgCl, paraffin, and agar had no effect. The bodies were found in the phagocytic mononuclear and giant cells. No evidence of any associated virus infection could be found. C. J. C. B.

Is the chromophobic part of the Golgi apparatus and mitochondria the ergastoplasm? M. K. SUBRAMANIAM (Proc. Indian Acad. Sci., 1937, **6**, B, 203—212).—The so-called "Nebenkern" is a mass of fibrillar structure most often seen in gland cells and said to be related to the phase of the secretory cycle. The ergastoplasm consists of filaments usually seen only after acetic acid or $HgCl_2$ fixation, that alters in amount and staining capacity at different parts of the secretory cycle. Both the mitochondria and the Golgi apparatus have a chromophobic core, that of the latter being known as the idiosome; this chromophobic component is demonstrable by the same methods as those used to show ergastoplasm filaments. Arguments are given for and against the author's final conclusion that in all probability the ergastoplasm and Nebenkern are really the chromophobic portions of the Golgi apparatus and mitochondria. E. E. H.

Nerve endings in sartorius. A. PEZARD and R. M. MAY (Ann. Physiol. Physiochim. biol., 1937, **13**, 460—473).—The frog's sartorius was examined histologically by modified Cajal impregnation. One eighth of the muscle only (pelvic end) was devoid of nerve-endings. Most of the motor-endings were found near the aneural part, and on the outer border. D. T. B.

Alveolar formations in the hypothalamus. J. B. DE OLIVEIRA E SILVA (Compt. rend. Soc. Biol., 1937, **126**, 603—606).—Lacunæ occur periodically in the hypothalamus of the dog and may be visible macroscopically. Their possible significance as secretory alveoli with stored material is discussed. D. T. B.

Influence of narcotics on the division of epithelial cells. E. EISENBERG (Trans. Physiol. Inst. Leningrad, 1936, **16**, 94).—The influence of narcotic substances on the division of epithelial cells was investigated on the skin of frogs. Different alcohols in equimolar concn. were used. Division ceases in the stage of metaphase at 15° with 0·4—0·8M-ethyl alcohol. Higher concns. cause gelatinisation, and shortening and thickening of chromosomes, and finally destruction of epithelial cells. Low concns. result in cessation of mitosis, with a subsequent increase of mitotic activity. Methyl and propyl alcohol also cause alterations in mitosis. The action of alcohols increased with their mol. wt. Narcotic action increases with rise of temp. J. WA.

Influence of isotonic solutions of sugar on epithelia of amphibia. I. KAMNEV (Trans. Physiol. Inst. Leningrad, 1936, **16**, 127—128).—Experiments on vital preps. show that the epithelial cells of the intestines and other organs do not change in isotonic solutions of mono- and di-saccharides. Consequently the saline ions of the external solution bathing the epithelial cells may be substituted by undissociated sugar mols. Striated and smooth muscle, on the other hand, undergo reversible destructive changes. J. WA.

New fixative for chromosome morphology. M. V. FAVORSKI (Compt. rend. Acad. Sci. U.R.S.S., 1937, **16**, 427—428).—Satisfactory use of preps. containing 5% aq. $UO_2(NO_3)_2$ 10, formalin 5, 0·1% H_2SO_4 (or saturated aq. picric acid) 5 parts, is described. A. G. P.

Microscopy with fluorescent light. R. JENKINS (Stain. Tech., 1937, **12**, 167—173).—The apparatus necessary for fluorescence microscopy is

described. A list is given of fluorochromes which activate tissues having no natural fluorescence. E. M. W.

Dioxan technique. H. W. MOSSMAN (Stain Tech., 1937, **12**, 147—156).—Dioxan is recommended as a clearing agent in paraffin embedding. It is not dangerously toxic if carefully used. E. M. W.

Investigation of fine structure of animal tissues by means of *X*-ray interference methods. F. O. SCHMITT (Naturwiss., 1937, **25**, 709—715).—A review of the application of the Laue method to resting and active muscle and nerve tissues, including technique and results. A. J. M.

Table for the interpretation of differential counts. [R. ELSDON-DEW (S. Afr. J. med. Sci., 1937, **2**, 7—9). R. M. M. O.

Culture of human marrow. E. E. OSGOOD (J. Amer. Med. Assoc., 1937, **109**, 933—936).—Human sternal marrow was cultured by a simple method whereby multiplication, maturation, and functional activity of cells of the granulocyte series can be followed for at least 6 weeks. By the same culture technique of human blood the duration of life of the neutrophiles averaged 61 hr., the eosinophiles from 8 to 12 days, and the basophiles from 12 to 15 days. These figures do not necessarily represent the normal duration of life of these cells in the blood, but the method offers a direct approach to this problem. R. L. N.

Criticism of sternal puncture. K. HELPAP (Klin. Woch., 1937, **16**, 559—560).—Examination of 32 human cadavers, none of which had suffered from a blood disease, showed that in 8 cases the blood cells were not uniformly distributed in the sternal marrow. F. W. L.

Sternal puncture in pernicious and achrestic anæmia. A. F. ZANATY (Lancet, 1937, **233**, 1365—1367).—Sternal puncture during life shows a megaloblastic erythropoiesis in pernicious anæmia during relapse, and a macroblastic erythropoiesis in achrestic anæmia. For this and other reasons it is suggested that achrestic anæmia is not due to lack of utilisation or mobilisation of pernicious anæmia factor, but is better regarded as a special form of aplastic anæmia. C. A. K.

Familial shift to the left of the leucocytes (Pelger's nuclear anomaly of the leucocytes). W. TILESTON (Ann. Int. Med., 1937, **11**, 675—681).—A case of familial shift to the left of the leucocytes is reported. There was a high % of staff cells, and very few segmented forms with more than two nuclei; the nuclei showed an even contour and no toxic granulation. C. A. K.

Normal and pathological myelogram. J. MALLARMÉ (Sang, 1937, **11**, 804—832).—Puncture technique for sternal marrow biopsy, and the types of cells and their proportions found in 12 normal adults of different ages, are described, as are also the bone-marrow picture in various types of anæmia, leukæmia, polycythæmia, and in tumours of the bone marrow and Hodgkin's disease. C. J. C. B.

Local differential white blood count in skin diseases. S. KOVACS (Arch. Derm. Syph., 1937, **176**, 130—137).—The differential white blood count on blood taken from an area of skin disease shows a relative agranulocytosis compared with blood from normal skin This occurs only in the skin diseases involving the corium (psoriasis, erythema indur. Bazin), but not in diseases involving the epidermis only. The local blood count is not, however, characteristic of any sp. disease. F. J.

Azurophilia and oxidase granules in myeloblasts and myelocytes. H. C. VOORHOEVE (Klin. Woch., 1937, **16**, 420—421).—Films of bone marrow (obtained by sternal punctures from three normal subjects) were stained by the Giemsa and Kardos methods and for the oxidase reaction. The no. of agranular cells (myeloblasts) stained by the Giemsa and the Kardos methods were compared with the results of the oxidase reaction. The average results were: Giemsa: agranular 20·4, granular 79·6; Kardos: 17·7 and 82·3, respectively; oxidase: negative 16·9, positive 83·1%. In all preps. only sporadic micromyeloblasts (about the size of lymphocytes) occurred. These cells as well as the usual myeloblasts (diameter about 15 μ.) gave a negative oxidase reaction. Therefore these cells, contrary to the usual opinion, have no, or at least not always, oxidase granules in the protoplasm. From the vals. found it appears that Kardos staining demonstrates granules better than Giemsa. From the average vals. it may be concluded that in normal subjects there are no normal oxidase positive myeloblasts if this term is used to describe agranular cells. F. W. L.

Ascorbic acid content of leucocytes. G. DE LUDANY and K. DE MEGAY (Compt. rend. Soc. Biol., 1937, **126**, 321—323).—Leucocytes from the abdominal cavity of rats and the circulating blood of dogs contain 20—25 and 19·8—30·7 mg. of ascorbic acid per 100 g., respectively. H. G. R.

Fixation of colouring matter by red corpuscles. A. DOGNON and S. ANDRÉ (Compt. rend. Soc. Biol., 1937, **126**, 375—376, 377—378).—Stains added to suspensions of red corpuscles in Ringer's solution were taken up by the cells and restored on washing with Ringer's solution. The process is not an adsorption and is not dependent on permeability. The amount of Nile-blue fixed by red cells in suspension is not related to nos. of cells. For a given no. of cells the concn. per cell increases with that of the medium. It is not due to adsorption, but to fixation of the pigment as an unstable compound. D. T. B.

Erythrocytes as osmometers. A. SLAWINSKI (Ann. Physiol. Physiochim. biol., 1937, **13**, 474—492).—The envelope of the erythrocyte presents aggregates of mols. with osmotically free water between; this water is "retained." The membrane has a double layer *in vitro* and is semipermeable. Occasional deviations from the osmotic laws are explained by the instability of the membrane and deposits of albumin in the plasma. The free water of the cell amounts to 54% in man, 48% in the horse. The vol. of the envelope is 17% of that of the cell. D. T. B.

Hæmolytic action of *Lachesis* venom. J. VELLARD and M. MIGUELOTE-VIANNA (Ann. Acad.

Brasil. Sci., 1937, **9**, 271—273).—The action of the venom on horse blood is chemical in nature. The activity is destroyed in 5 min. at 100°. The capacity of the blood to acquire the action is destroyed in 30 min. at 58°. The intensity of the action varies with different species of *Lachesis*. F. R. G.

Effects of simple hæmolysins in hypotonic systems. E. PONDER (Protoplasma, 1937, **27**, 523—529).—Except for a small inhibition, due to decreased electrolyte content, the lytic effects of simple lysins such as saponin and the bile salts are the same for cells in hypotonic and isotonic systems. The resistance to hypotonic solutions of cells which have been exposed to sub-lytic quantities of a variety of lysins is not less than that of untreated cells and often greater. The lytic effects of hypotonic solutions and of the simple lysins are accordingly non-additive. V. B. W.

Hæmolysis of red cells in nephritis in saponin systems. F. J. C. HERRALD and M. PIJOAN (Amer. J. clin. Path., 1937, **7**, 404—417).—Saponin was added quantitatively to a known vol. of washed red cells in saline, and the velocity of hæmolysis was noted by means of the Evelyn photometer which was used to count the remaining red cells. The photometer was calibrated by actual counts in the counting chamber. The red cells from nephritic patients hæmolysed more slowly than those from normals or anæmic subjects in saponin hæmolytic systems. Serum from nephritics, when added to the red cells of normals or other nephritic patients, had a marked inhibitory effect on their hæmolysis by saponin. C. J. C. B.

Effect of purified insulin on the number of red cells in the blood. R. GRANDPIERRE and P. GROGNOT (Compt. rend. Soc. Biol., 1937, **126**, 350—352).—A slight decrease in the no. of red cells was observed, the increase observed by other workers probably being due to the presence of vagotonin in the insulin prep. used. H. G. R.

Effect of removal of the pancreas on the number of red cells in the blood. D. SANTENOISE, C. FRANCK, R. GRANDPIERRE, and M. VIDACOVITCH (Compt. rend. Soc. Biol., 1937, **126**, 354—356).—Anæmia develops after pancreatectomy in spite of administration of pure insulin, but is relieved by injection of vagotonin. H. G. R.

Relation of rickets to anæmia. K. B. McDONOUGH and D. R. BORGEN (J. Lab. Clin. Med., 1937, **22**, 819—824).—There is no significant difference in the hæmoglobin content of blood or the total and available liver-Fe of normal and rachitic chicks. T. H. H.

Influence of anæmia and poor social circumstances during pregnancy on subsequent history of mother and child. W. J. S. REID and J. M. MACKINTOSH (Lancet, 1937, **233**, 1389—1392).—The influence of anæmia and poor social circumstances in pregnancy on the subsequent history of mother and child was studied in 1094 women. It was shown that neonatal and infant death rate, and infantile sickness during the first year, were increased by anæmia and poverty. C. A. K.

Ætiology and treatment of idiopathic hypochromic anæmia. W. M. FOWLER and A. P. BARER (Amer. J. med. Sci., 1937, **194**, 625—635).—Fe balance experiments were conducted on 11 patients with hypochromic anæmia. Menstrual blood loss and an improper absorption of Fe due to deficient gastric secretion were found to be sufficient to account for the anæmia. There was no evidence of faulty Fe metabolism, as large doses of Fe produced a rapid hæmoglobin response. 1—3 g. of Fe NH_4 citrate daily produced a fairly satisfactory response, even though achlorhydria was present. These amounts led to a storage of Fe in addition to that used in hæmoglobin formation. Cu or a liver fraction, when given with Fe, did not increase the rapidity of hæmoglobin production. Fe intramuscularly was ineffective. R. L. N.

Reticulocyte response in pigeons to injections of liver extract. G. E. SHAW and J. PRITCHARD (Quart. J. Pharm., 1937, **10**, 371—379).—Pigeons fed on polished rice show a decline in wt. and reticulocyte count (staining method described). Transference to a maize diet after 14 days results in increases in wt. and count, and during this period intravenous injection of clinically active liver extracts produces a definite response in the count within 16 hr. Since, however, inactive preps. also give a response, the method is of no val. for the assay of hæmopoietic activity. F. O. H.

New factor in production and cure of macrocytic anæmias and its relation to other hæmopoietic principles curative in pernicious anæmia. L. WILLS, P. W. CLUTTERBUCK, and B. D. F. EVANS (Biochem. J., 1937, **31**, 2136—2147; cf. A., 1937, III, 204).—Crude extracts of liver, yeast, marmite, and wheat germ are curative in nutritional macrocytic anæmia in monkeys and in true pernicious anæmias. Highly purified extracts of the liver principle are inactive in monkey anæmia, but still have good activity in true anæmia. Monkey anæmia is not produced by a simple lack of the liver principle contained in anahæmin, but is partly due to lack of some other factor, which is probably related to the vitamin-B_2 complex, but not identical with the filtrate factor of Edgar and Macrae (*ibid.*, 281). The active factor of marmite is inactivated by 90% but not by 80% alcohol, whereas that of acetic acid extracts of brewer's yeast and of wheat germ can be extracted with 90% alcohol. The difference may be due to loss of some stabilising agent during prep. of marmite. J. N. A.

Globin utilisation by the anæmic dog to form new hæmoglobin. F. S. ROBSCHEIT-ROBBINS and G. H. WHIPPLE (J. Exp. Med., 1937, **66**, 565—578).—In standard anæmic dogs utilisation of globin for hæmoglobin regeneration can be demonstrated. The globin can be given unchanged by mouth or as a digest. It has been administered intravenously, but doses must be small if toxic symptoms are to be avoided. By mouth as much as 40% of globin utilisation for hæmoglobin regeneration can be shown. A. C. F.

Relationship of achylia gastrica to pernicious anæmia. W. B. CASTLE, C. W. HEATH, M. B.

STRAUSS, and R. W. HEINLE (Amer. J. med. Sci., 1937, **194**, 618—625).—Observations were made on 9 cases of pernicious anæmia to determine the site of interaction of the extrinsic and intrinsic factors. At p_H 1·8 or 2·5 administration of a mixture of beef muscle and normal gastric juice had no effect. At p_H 5 or 7, the mixture showed a curative action. The negative results from the acid mixture were not due to destruction of the intrinsic factor, and it is suggested that the acid environment was unsuitable for an essential interaction between beef muscle and gastric juice. *In vitro* experiments to synthesise a substance resembling in thermostability the active principle of crude extracts were unsuccessful. Thus, incubation for 2 hr. at p_H 7 of beef muscle with (*a*) normal human gastric juice or (*b*) thereafter with normal human duodenal contents, or (*c*) with normal human gastric juice and thereafter with hog duodenal and small intestinal mucosa, gave negative results. It is suggested that the gastric intrinsic factor is possibly an enzyme active near p_H 7 but not at p_H below 2·5. R. L. N.

Reticulocyte reaction in rats after injection of gastric juice. L. CROSETTI, G. BAJARDI, and M. MARGULIUS (Klin. Woch., 1937, **16**, 677—678).—A reticulocytosis always occurred after the injection of gastric juice from healthy subjects or from patients not suffering from pernicious anæmia. Of 24 cases of this disease, 15 gave a negative but 5 an undoubted positive result; untreated cases were negative. In those under liver treatment 2 were positive, 5 negative, and 2 uncertain. The results are considered to support the view that the substance producing the reticulocytic response and Castle's principle are identical. F. W. L.

Intravenous liver extract in the therapy of pernicious anæmia. H. B. MULHOLLAND (Ann. Int. Med., 1937, **11**, 671—674).—In a case of pernicious anæmia oral and intramuscular administration of liver, ventriculin, and blood transfusion produced no response. Intravenous liver extract then resulted in a prompt and complete remission, and the improvement was maintained by intramuscular liver-extract. The only evidence of infection was a mild cystitis. C. A. K.

Does liver supply factors in addition to iron and copper for hæmoglobin regeneration in nutritional anæmia? E. B. HART, C. A. ELVEHJEM, and G. O. KOHLER (J. Exp. Med., 1937, **66**, 145—150).—Anæmia was produced by prolonged milk feeding in young rats. The beneficial action of liver extracts was found to be due exclusively to their Fe and Cu content. The potency of various liver extracts varied directly with their Fe and Cu content. A. C. F.

Fixation of dyes by erythrocytes *in vitro*. (A) (B) Effect of the concentration of erythrocytes and dye. A. DOGNON and S. ANDRÉ (Compt. rend. Soc. Biol., 1937, **126**, 375—376, 377—378).—(A) Erythrocytes reversibly fix Nile-blue and crystal-violet from Ringer's solution.

(B) The quantity of dye fixed increases with the concn. of erythrocytes and of Nile-blue, but decreases with the concn. of crystal-violet. H. G. R.

Decreased red-cell fragility after splenectomy. A. S. GORDON, W. KLEINBERG, and E. PONDER (Amer. J. Physiol., 1937, **120**, 150—153).—The decreased fragility of the red cells of guinea-pigs after splenectomy is due to the cells being able to attain a greater crit. vol. for hæmolysis than the cells of the normal animal. The removal of the spleen is followed by a modification in the structure of the red-cell envelope. M. W. G.

Sub-groups in blood-group investigation. F. J. HOLZER (Klin. Woch., 1937, **16**, 481—483).—A description of the reactions of the sub-groups A_1, A_2, A_1B, and A_2B to the corresponding agglutinins together with the different methods employed for their differentiation. The question of sub-groups in A and B is discussed. F. W. L.

Antagonism of insulin and adrenaline on the behaviour of blood-platelets and -sugar. E. BENHAMOU, GILLE, and NOUCHI (Compt. rend. Soc. Biol., 1937, **126**, 456—458).—Simultaneous injection of insulin and adrenaline into fasting diabetics increases the blood-platelets and -sugar before the decrease of both vals. due to insulin occurs. H. G. R.

Control of blood-platelet count. E. S. IVANITZKY-VASILENKO and V. I. PROSTIAKOVA (Arch. int. Pharmacodyn., 1937, **57**, 110—117).—Mechanical and chemical stimulation of the mouth cavity is accompanied by a pronounced, temporary decrease in the no. of platelets in the peripheral circulation. water in the mouth at a temp. of 3° diminishes the platelet count in the surface vessels, at 37° there is no effect, and at 60° there is a slight increase in the count. Ignorance of these facts may vitiate platelet counts clinically. D. T. B.

Hæmophilia. II. W. M. BENDIEN and S. VAN CREVELD (Acta. brev. neerl. Physiol., 1937, **7**, 2—4).—A saline solution of "coagulation-globulin" prepared from normal serum by pptn. with acetic acid retained 50% of its hæmophilic plasma-clotting activity after keeping in the cold for one week, whilst the corresponding serum from which it was prepared lost all its activity in this period. After injections of this solution the clotting time of one hæmophilic patient was brought back to normal. T. F. D.

Thrombocytopenic purpura and hæmophiloid. M. F. MAS Y MAGRO, jun. (Sang, 1937, **11**, 916—921).—Two cases of children in whom almost the only clinical sign was severe epistaxis are described. The one had all the hæmatological features of thrombocytopenic purpura; the other had a definite family history of bleeding over three generations, but had normal blood findings. The latter case is termed hæmophiloid. C. J. C. B.

Characteristic changes in rate of sedimentation of erythrocytes in solutions of oligodynamic concentration. H. NAKAMURA and K. KURODA (J. Biochem. Japan, 1937, **25**, 555—571).—Erythrocytes of ox and goose show characteristic rises and falls, respectively, in the curves of concn.–sedimentation rate at oligodynamic concns. of K, Na, Ca, Ba, and Sr halides, the concn. for min. rate of the former being equal to that for max. rate of the

latter. The stability of suspensions of erythrocytes depends on the valency of the cation present. F. O. H.

Sedimentation rate after burns. F. VAN DER HULST (Arch. int. Pharmacodyn., 1937, **57**, 129—132).—Extensive aseptic burns in the rabbit are associated with a diminished sedimentation rate during the first few hr., followed by a much increased rate after 24 hr. These changes are prevented by aseptic excision of the burnt tissues. D. T. B.

Sedimentation rate in experimental anæmia in the rabbit. R. O. GREGG (J. Lab. clin. Med., 1937, **22**, 786—795).—In acute anæmia there was an acceleration of the sedimentation rate of whole blood in nearly direct proportion to the degree of anæmia. In chronic anæmia there was a gradual diminution of the sedimentation rate both of whole blood and of suspensions of cells in plasma. In recovery from chronic anæmia there was a gradual acceleration in the sedimentation rate of suspensions of cells in plasma which lagged behind the rise in red-cell count. T. H. H.

Rate of sedimentation of erythrocytes in chemically and physically defined, simple medium. H. NAKAMURA and K. KURODA (Keijo J. Med., 1937, **8**, 168—197).—With fixed [NaCl], the rate decreases with increasing concn. of erythrocytes in suspension. Heat accelerates the rate, but there is no direct relationship. With fixed concn. of erythrocytes, the rate varies directly with [NaCl]. With very dense suspensions, *e.g.*, citrated blood, the process of sedimentation is complex. Agitation of the system has no marked effect. The vol. of each erythrocyte in the deposit is at a min. in the medium of oligolytic concn. Using centrifugal force, the deposit from ox blood has a min. vol. when 4% of NaCl is present. The amount of H_2O bound to the disperse phase separable by an external force depends on [NaCl]. J. N. A.

Specific property of animal species for stability of suspensions of erythrocytes in chemically and physically defined media. H. NAKAMURA and K. KURODA (Keijo J. Med., 1937, **8**, 198—235).—The stability of suspensions of erythrocytes of man, mammals, birds, reptiles, amphibia, and fish in aq. NaCl depends on [NaCl] and for each species there is a definite sp. [NaCl] for max. stability. Curves expressing relationship between [NaCl] and rate of sedimentation of erythrocytes resemble each other for the same species, but differ with different species. Curves for nucleated erythrocytes show a marked rise in the region of oligolytic concn., whilst those of non-nucleated erythrocytes show a characteristic fall. J. N. A.

Buffered citrate solution in blood transfusion. T. GRAY (Lancet, 1937, **233**, 1431).—A buffered citrate solution which does not produce the reactions sometimes seen after blood transfusion with the usual unbuffered citrate is described. C. A. K.

Further experience with heparinising the donor in blood transfusions. P. HEDENUS (Lancet, 1937, **233**, 1186—1188).—Intravenous injection of heparin into the donor produced satisfactory non-coagulant blood in 150 transfusions. No ill-effects were observed in the donor, and the concn. of heparin in the recipient's blood was too low to prevent clotting. C. A. K.

Isoelectric point of hæmoglobin. G. N. MODONA (Arch. Sci. biol., 1937, **23**, 171—184).—Hæmoglobin and oxyhæmoglobin in phosphate buffer solutions have isoelectric points at p_H 6·8 and p_H 6·73, respectively. In solutions containing CO_2 and $NaHCO_3$ the corresponding figures are 6·59 and 6·55. It is concluded that a compound of CO_2 and hæmoglobin is formed which is more acid than uncombined hæmoglobin. R. S. CR.

Modifications in hæmoglobin/erythrocyte ratio due to hæmorrhage. A. DE NIEDERHÄUSERN and A. GAMBIGLIANI-ZOCCOLI (Arch. Sci. biol., 1937, **23**, 150—170).—The erythrocyte count, but not the hæmoglobin val., proportionately decreases for 24 hr. following a 20—40% loss of blood in dogs and rabbits. The erythrocyte vol. and surface and the hæmoglobin content increase. A return to normal conditions occurs after 2—3 days. F. O. H.

Respiration of non-nucleated erythrocytes in presence of methylene-blue. G. MORUZZI (Arch. Sci. biol., 1937, **23**, 142—149).—Erythrocytes (rabbit) in aq. NaCl-PO_4'''-methylene-blue oxidise glyceraldehyde [but not glycerol (with or without pyruvic acid), α-glycerophosphate, Na glycerate, or methylglyoxal] without production of CO_2, the oxidation not being affected by 0·01M-NaF or Na pyruvate or glycerate. Fructose and mannose are oxidised at approx. the same rate as glucose but galactose, sorbitol, gluconate, glycuronate, and saccharate are not oxidised. The oxidation of glyceraldehyde or lactic acid, but not of glucose, is independent of the presence of PO_4'''. F. O. H.

Splitting of the hæmocyanin molecule by ultrasonic waves. S. BROHULT (Nature, 1937, **140**, 805).—Sedimentation analysis shows that after treatment with sonic waves with a frequency of 25×10^4 per sec. hæmocyanin from *Helix pomatia* is split into half and eighth mols., corresponding in size with the fragments obtained by changing p_H. Unlike these fragments, however, those that result from sonic action do not recombine to form the original mol. on a change in p_H from 7·2 to 6·2. The electrophoretic properties are unchanged by the treatment. L. S. T.

Effect of the ionic composition of the medium on the fixing power of erythrocytes *in vitro*. A. DOGNON and S. ANDRÉ (Compt. rend. Soc. Biol., 1937, **126**, 492—494).—Fixation of a dye (*e.g.*, Nile-blue) by erythrocytes in Ringer's solution depends primarily on the presence of CO_3''. $Ca^{\cdot\cdot}$ is required also to give the max. effect. H. G. R.

Intermediary calcium complex in blood coagulation. J. H. FERGUSON (Amer. J. Physiol., 1937, **119**, 755—762).—In a series of controlled experiments, plasma thrombin (prothrombin–kephalin–Ca mixture) (*a*) "fresh" (few min.); (*b*) "ripe" (several hours), and (*c*) electrodialysed (Ca-free) were subjected to oxalation and citration before testing clotting activity on prothrombin-free fibrinogen. The decalcifying anticoagulants showed three phenomena: (1) prevention of thrombin formation by

depressing ionisation of the Ca salts essential for the process of activation, (2) progressive inactivation of "fresh" thrombin, and (3) a characteristic immediate effect varying with concn. which is the sole action seen in tests on "ripe" and electrodialysed thrombin. The data obtained indicate that Ca forms an intermediary complex (prothrombin–kephalin–Ca "compound"), which soon passes over into stable thrombin. Once the thrombin is "ripe" or fully elaborated, however, the Ca is no longer an essential component. M. W. G.

Chemistry of blood coagulation. IV. Lipoid inhibitors of clotting in mammalian tissue. V. Synthetic cerebroside-sulphuric acids and their action in blood clotting. E. CHARGAFF (J. Biol. Chem., 1937, **121**, 175—186, 187—193; cf. A., 1937, III, 4, 293).—IV. The prep. of lipoid inhibitors of blood coagulation from brain (sheep, pig), spinal cord (cattle), and erythrocytes (sheep) is described.

V. *Cerebron-* and *kerasin-sulphuric acid* are prepared from the cerebrosides by the action of $ClSO_3H$ in pyridine at −12°. After removing excess of pyridine, the *K* salts are pptd. from a alcoholic solution by alcoholic KOH. These compounds are potent anticoagulants. Sphingomyelin, purified as the reineckate (cf. Thannhauser and Setz, A., 1937, III, 56), also yields a H_2SO_4-compound, the K salt of which is insol. in acetic acid and possesses anticoagulant properties. P. G. M.

Technique of Mas y Magro's method for coagulation time and clot retraction. M. F. MAS Y MAGRO, jun. (Sang, 1937, **11**, 921—925).—The effect of different concns. of salt solutions on the method of Mas y Magro for determining the coagulation time is given and a slight modification of the method described. The original method consisted in running 40 cu. mm. of blood from a finger-prick on to the surface of 0·5 c.c. of 0·85% saline in a small tube, gently mixing without bubbles, and then tilting the tube at intervals until the surface becomes immobilised. A further control tube with a slightly different salt solution is now used. C. J. C. B.

Restoration of plasma-proteins after plasmaphoresis. R. FUKUHARA (Tohoku J. Exp. Med., 1937, **30**, 482—533).—Plasmaphoresis was carried out in three groups of rabbits after bilateral nephrectomy, poisoning with U nitrate, and poisoning with catharides. Restoration of the total protein of the plasma rapidly occurred, but the colloid osmotic pressure did not recover as quickly as in normal animals, showing that the albumin/globulin ratio was disturbed. This latter result is attributed to associated liver damage. In rabbits poisoned with P and $CHCl_3$, there is a fall in blood-hæmoglobin, plasma-protein, and osmotic pressure; after plasmaphoresis in these animals restoration of plasma-protein and osmotic pressure does not occur because of damage to the liver and other organs. Splenectomy delays the restoration of the plasma-proteins in normal animals subjected to plasmaphoresis. If plasmaphoresis is performed in normal rabbits fed for 3—4 weeks with dried thyroid, the plasma-proteins are restored, but the osmotic pressure remains low. If plasmaphoresis is performed after thyroidectomy, the restoration of both total plasma-proteins and osmotic pressure is retarded to a still greater degree. E. G. W.

Influence of pregnancy and lactation on regeneration of serum-protein. D. MELNICK and G. R. COWGILL (J. Exp. Med., 1937, **66**, 509—526).—Quant. plasmaphoresis in dogs during pregnancy rapidly reduces the protein content of the plasma to the basic level. This indicates a very limited protein-regenerating power in pregnancy. It is thought that the calls of the fœtus and of milk formation on the body-proteins constitute important factors in the production of the hypoproteinæmia of pregnancy. A. C. F.

Influence of prolonged plasmaphoresis on regeneration of serum-protein. D. MELNICK and G. R. COWGILL (J. Exp. Med., 1937, **66**, 493—508).—Dogs fed on an adequate protein diet are able to regenerate serum-protein very rapidly when subjected to intensive quant. plasmaphoresis over a period of 12 weeks. In each week an amount of protein about equal to the normal plasma content was formed. It therefore seems probable that hypoproteinæmia associated with various kidney lesions is due, not to protein loss alone, but also to impairment of the regenerative mechanism. A. C. F.

Blood changes in trinitrotoluene workers. M. V. MONTFORT-SALES (Sang, 1937, **11**, 899—915).—The blood picture was studied in 10 trinitrotoluene workers with clinical signs of irritation, viz., pallor, yellowish colour of the skin, dermatoses, pruritus, hypotension, and sometimes diarrhœa, and in 5 workers without clinical signs. Only one case showed an abnormal red cell count (8,700,000). Anisocytosis was present (microcytosis or macrocytosis). The no. of leucocytes was diminished and often an eosinophilia was present. Sometimes the lymphocytes showed a hyperbasophilic cytoplasm. The hæmatological details of the cases are incomplete. C. J. C. B.

Action of aniline derivatives on blood. M. P. GLEY (Bull. Acad. Med. Paris, 1937, **118**, 377—382).—Experiments *in vivo* (on hares) and *in vitro* (blood of warm-blooded animals) indicate that aniline, acetanilide, and *p*-aminobenzenesulphonamide, after being oxidised to a hydroxylamine compound, cause the formation of methæmoglobin, but if sulphide is present of sulph-hæmoglobin. The amount of sulphide available depends to some extent on S intake in the food. B. K.

Relation of serum-calcium to serum-albumin and -globulins. A. B. GUTMAN and E. B. GUTMAN (J. Clin. Invest., 1937, **16**, 903—919).—The relation of total serum-Ca to total serum-protein and several protein fractions was studied by graphic and statistical analysis in 128 patients including 15 normals but excluding cases with a primary disturbance in Ca metabolism, with hyperphosphatæmia, or with malnutritional hypoproteinæmia. The total Ca was ∝ the total protein in nephrotic and normal sera, but the level of serum-Ca did not rise in hyperprotæinemia in the types of case studied. The discrepancy was apparently in that the globulin fraction in hyperglobulinæmia binds little Ca. It is suggested that

the total serum-Ca was composed of four fractions: (1) Ca bound to and α albumin; (2) Ca bound to a globulin fraction which remained relatively const. in amount irrespective of the total globulin level; (3) Ca bound in small amount to another globulin fraction which increased with the total globulin level but became significant only in marked hyperglobulinæmia; (4) Ca not bound to protein and relatively const., as cases of primary Ca metabolism disturbances were excluded. A regression equation is given relating total Ca to albumin and two arbitrary globulin fractions which appears more generally valid in the types of case studied than are equations relating total Ca to total protein, to albumin and total globulin, or to albumin alone. C. J. C. B.

Effect of prolonged low-protein diet on serum-lipins of dogs. I. H. PAGE, L. E. FARR, and A. A. WEECH (J. Biol. Chem., 1937, **121**, 111—116).—The serum-lipins are little affected by a low-protein diet even when serum-albumin falls below 1·5%. P. G. M.

Blood-catalase, hæmoglobin, and red-cell volume. B. ANDERSEN (Acta med. scand., 1937, **92**, 375—388).—Catalase activity was estimated by the rate of breakdown of H_2O_2 in blood under standard conditions. In 28 cases measurements of hæmoglobin, red-cell count and vol. were made. The expressions catalase content × hæmoglobin and catalase content × red-cell vol. were very const.; catalase content × red cell count was variable, being lowest in children under 2 years and increasing with age up to adult age. C. A. A.

Non-hæmoglobin iron in whole blood. H. W. JOSEPHS and P. WINOCUR (Johns Hopkins Hosp. Bull., 1937, **61**, 75—89).—Total Fe of blood corresponds with that calc. from hæmoglobin within ±6 mg. per 100 c.c. except in certain conditions, *e.g.*, in early life, during Fe therapy, and during infections when it exceeds hæmoglobin-Fe. Theories are advanced for the possible function and form of the non-hæmoglobin Fe of blood. T. F. D.

Calcium-ion concentration of serum in allergic diseases. W. B. SHERMAN and M. GLIDDEN (Amer. J. med. Sci., 1937, **194**, 674—678).—The ionic and total Ca concn. in the sera of 53 patients with various allergic diseases determined by the method of MacLean and Hastings showed no significant variation from 25 control observations. R. L. N.

Determination of calcium in capillary blood. T. M. VAN BERGEN and R. M. HILL (J. Lab. Clin. Med., 1937, **52**, 857—860).—Determination of blood-Ca by the method of Nordbö on 0·1 c.c. of serum and the method of Clark and Collip on 1 c.c. of the same serum gives similar results. Ca in capillary blood obtained by finger prick was the same as that in venous blood. T. H. H.

Chlorine ion in ventricular, cisternal, and spinal fluids and corresponding blood-serum. H. H. CHRISTIANSEN (J. Lab. Clin. Med., 1937, **22**, 803—805).—Analyses of 30 ventricular fluids, supplemented with 8 spinal fluids and 2 cisternal fluids, show that the Cl-ion concn. is the same throughout the cerebrospinal fluid, being about 20% above the corresponding val. for serum. T. H. H.

Relation between plasma- and cerebrospinal fluid-calcium. A. T. CAMERON and V. H. K. MOORHOUSE (J. Physiol., 1937, **91**, 90—100).—The ratio of cerebrospinal fluid-Ca to serum-Ca in dogs (anæsthetised with morphine and urethane) with normal blood-Ca averaged 50% for 24 animals. Results of experiments following injections of Ca salts or of parathormone, with or without continuous open drainage from the cisterna magna, lead to the conclusion that the cerebrospinal fluid-Ca represents the diffusible fraction of the plasma-Ca only when the blood-Ca is normal. A. C.

Magnesium of serum in pregnancy. R. WOLFF and J. A. BOURQUARD (Compt. rend. Soc. Biol., 1937, **126**, 345—347).—The average quantity of Mg in the blood of normal women is 19 mg. per litre. In pregnancy it is 30% less in the earlier months and 15% less towards the end. D. T. B.

Influence of muscular work on catalase number and index of blood. F. VON KRÜGER (Arbeitsphysiol., 1937, **9**, 562—568).—In 19 persons age 20—25 after 2 hr. continuous cycling over 28—30 km. the average rise in red blood corpuscles was 8%. The catalase no. determined by Masch's method (1931) showed a fall of 8%. The catalase index was reduced by 15%. E. J. W.

Serum-lipase in multiple sclerosis. K. C. SWAN and H. B. MYERS (Arch. Neurol. Psychiat., 1937, **38**, 288—290).—Repeated determinations were made of the serum-lipase of 9 patients over a period of 18 months. In 8 of these positive variations were within the limits of experimental error. In the remaining case definite lipolytic activity was found on one occasion, but was later absent. In 68 control patients without evidence of central nervous system disease, the results of serum studies were negative. If normal serum was exposed to air at room temp. before incubation, lipolytic activity often developed. D. P. C. L.

Effect of liver therapy on normal blood-cholesterol. P. VAN DE CALSEYDE (Compt. rend. Soc. Biol., 1937, **126**, 252—255).—Hypercholesterolæmia, not due to either the hæmatopoietic factor, vitamin-*A*, or cholesterol, was observed. H. G. R.

Apparatus for the micro-determination of cholesterol in blood. E. M. ABRAHAMSON (Science, 1937, **86**, 477—478). L. S. T.

Cholesterol metabolism in guinea-pigs inoculated with tubercle bacilli. I. Blood-cholesterol and -cholesteryl esters in normal and infected guinea-pigs. K. YUSAWA (J. Biochem. Japan, 1937, **25**, 657—669).—The blood-cholesterol and -cholesteryl esters are increased (by 27 and 40%, respectively) following injection of virulent (but not avirulent) strains of the bacilli. F. O. H.

Effect of diminished atmospheric pressure on blood-cholesterol. E. WISCHNOWITZER (Z. ges. exp. Med., 1936, **97**, 780—797; Chem. Zentr., 1936, i, 4318—4319).—In normal rabbits the ratio of free/esterified cholesterol in serum was 1 : 1·8 and in

erythrocytes 1 : 0·4. Diminution of pressure increases both the free and total cholesterol. A. G. P.

Determination of total blood-cholesterol. F. RAPPAPORT and H. ENGELBERG (Klin. Woch., 1937, **16**, 610—611).—Analyses can be carried out on 0·2 c.c. of whole blood or serum. The specimen is hydrolysed under 3 atm. pressure with Na ethoxide. The cooled mixture is extracted with chloroform and light petroleum and the extract evaporated to small bulk. This is oxidised by $K_2Cr_2O_7$–H_2SO_4 using Ce sulphate as catalyst. Parallel determinations by this method and the digitonin method corresponded closely. For specimens containing more than 600 mg. per 100 c.c. 0·1 c.c. of blood or serum is used. F. W. L.

Serum-cholesterol in patients with peptic ulcer. F. M. OFFENKRANTZ and F. FERARU (J. Lab. Clin. Med., 1937, **22**, 780—785).—A study of cholesterol vals. for the blood-serum of 59 patients with peptic ulcer was made by use of the Schoenheimer and Sperry technique. The range of total serum-cholesterol was 98—300 mg. per 100 c.c. and of free cholesterol 32—83·7 mg. per 100 c.c. T. H. H.

Blood-lipin studies in a case of xanthomatosis associated with hepatic damage. A. CHANUTIN and S. LUDEWIG (J. Lab. Clin. Med., 1937, **22**, 903—911).—A case of xanthomatosis with marked lipin disturbance, following arsenical hepatitis, is described. The plasma was characterised by reduction of cholesteryl esters and of neutral fat, and increased free cholesterol, phosphatides, and total lipins. Treatment with a fat-free diet reduced the lipin constituents without affecting the clinical condition of the patient. The administration of betaine hydrochloride, choline hydrochloride, thyroid extract, liver extract, and insulin had little effect. T. H. H.

Plasma-lipins in various types of lipæmia (with special reference to renal diesease). F. K. HERBERT (Brit. J. Exp. Path., 1937, **18**, 355—369).—Determinations of total lipin extract, lipin-P, free cholesterol, total unsaponifiable matter, total cholesterol, total fatty acids, and I val. of the fatty acids were made on plasma from 8 normal patients, 7 cases of renal œdema, 1 case of lipæmia in the terminal stage of chronic nephritis, 1 case of non-diabetic xanthoma, and 1 case of gross diabetic lipæmia with xanthoma. An improvement of Bloor's method is described; it yields a total extract comparatively free from non-lipin matter, but not such a complete extraction of phospholipin. In the cases of lipæmia investigated, all lipin fractions were increased, and in the renal œdema and non-diabetic xanthoma cases, the glyceride formed a larger proportion of the total than normally and the phospholipin is relatively decreased. The other fractions and I vals. of the separated fatty acids were within normal range. In gross diabetic lipæmia glycerides formed a large proportion of total lipins, and I vals. of the fatty acids tended to be low. It appears that in these pathological lipæmias of moderate degree the plasma-lipins probably represent a mixture of those mobilised from reserve body stores and those mobilised from the liver. R. L. N.

Ketonæmia in infancy. C. H. GRAY (Lancet, 1937, **233**, 1017—1019).—The blood-ketone val. of healthy infants varies from 1·4 to 2·0 mg. per 100 ml. Vomiting infants over 3 months of age show much higher vals. (2—19 mg. per 100 ml.). L. S. T.

Determination of blood-ketones. C. T. RIETTI (Compt. rend. Soc. Biol., 1937, **126**, 617—619).—The turbidity obtained with the distillate and Scott Wilson's reagent, after oxidation of the tungstic acid filtrate of blood with acid $K_2Cr_2O_7$ and distillation in Parnas' apparatus, is compared with the distillate from a known quantity of acetone. The method is accurate to 3—5% using 0·01—0·03 mg. of acetone in 1 c.c. of blood. H. G. R.

Effect of dihydrofolliculin benzoate on blood-sugar. E. ZUNZ and J. LA BARRE (Compt. rend. Soc. Biol., 1937, **126**, 267—269).—Injection of the benzoate into the dog produces a slow hyperglycæmia. If the adrenal veins are ligatured a slow hypoglycæmia is observed. H. G. R.

Influence of venom of Siamese snakes on the blood-sugar of rabbits. K. RAI (Japan. J. Med. Sci., 1937, IV, **10**, 163—182).—The venoms of *Agkistrodon rhodostoma*, *Vipera russellii*, and *Bungarus fasciatus* produce hyperglycæmia in normal rabbits but those of *Naja tripudians* and *N. hamadryas* have no such effect in sublethal doses. Hyperglycæmia is less marked in splanchnicotomised rabbits and absent in adrenalectomised rabbits, indicating that hyperglycæmia depends on the adrenals. E. M. W.

Mechanism of the hypoglycæmia following large injections of glucose. E. SOTIRIADOU (Praktika, 1935, **10**, 136—139; Chem. Zentr., 1936, i, 3856).—Blood-sugar in dogs diminished (50%) 1—2 hr. after the injection. Subcutaneous administration of posterior pituitary hormone 30 min. prior to injection of glucose results in a very small hypoglycæmia. Large injections of glucose probably cause liberation of insulin. A. G. P.

Fixation of potassium injected into blood. B. A. HOUSSAY and A. D. MARENZI (Compt. rend. Soc. Biol., 1937, **126**, 613—615).—K injected into chloralosed dogs is rapidly eliminated from the blood. It is fixed by liver and muscles, not by red cells, but a quantity is excreted by kidney and gut. D. T. B.

Phosphorus compounds of the blood of various fishes. T. OGAWA (J. Biochem. Japan, 1937, **25**, 393—403).—The total blood-P of teleosts is less than that of birds and reptiles but more than that of mammals, the difference being mainly due to the high acid-sol. and adenylpyrophosphoric acid-P. The blood of the fresh-water fish, *Cyprinus carpio*, contains more of the various P compounds (especially acid-sol. P) than does the blood of the sea-water fish, *Pagrosomus major*. The blood of elasmobranchs has a lower content of P compounds (especially inorg. P, adenylpyrophosphoric acid, and hexose phosphate) than that of the teleosts. F. O. H.

Adsorption of β-lysine from blood serum. A. PETTERSSON (Z. Immunitätsforsch., 1935, **86**, 407—416; Chem. Zentr., 1936, i, 4028).—β-Lysine is adsorbed on stearic acid (optimum p_H 6·4—6·8), which is sub-

sequently separated by dissolution in acetone. The residue is taken up in water or broth and conc. in a vac. The product contains β-lysine partly in a bactericidal form, or more frequently only the factor which reactivates heat-inactivated serum. β-Lysine is more thermostable in water than in serum.

A. G. P.

Complement-fixing properties of heparin salts. P. J. WISING (Acta med. scand., 1937, **91**, 550—554).—Both Ca and Na heparin, prepared according to the method of Jorpes, showed a strong inhibitory effect on the complement of fresh guinea-pig serum and oxalate plasma; this was definitely seen with dilutions of heparin of 10^{-6}, which is the greatest dilution inhibiting coagulation. In higher concns. Ca heparin has a greater complement-fixation effect than the Na salt on both serum and oxalate plasma.

C. A. A.

Removal of intravenously injected bilirubin from the blood stream in the dog. C. A. DRAGSTEDT and M. A. MILLS (Amer. J. Physiol., 1937, **119**, 713—719).—Pure bilirubin dissolved in distilled water with the aid of a few drops of 10% aq. NaOH was injected intravenously in doses of 5 and 10 mg. per kg. Blood samples (oxalated) were withdrawn at 5, 30, 60, 90, and 120 min. from either the femoral or external jugular vein. Bilirubin determinations were made on plasma by the Gibson and Goodrich modification of Van den Bergh's procedure. Bilirubin was removed very rapidly from the blood of normal dogs, more slowly under ether–barbital anæsthesia; this was immediately prevented by biliary obstruction. The removal of bilirubin from the blood stream is usually related to its excretion in the bile. Decholin has little effect on the clearance of bilirubin but in anæsthetised animals it tends to restore the normal clearance rate.

M. W. G.

Comparison of the methods of Laudat and Mohr for determination of blood-chlorine. A. TAVARES (Rev. Chim. pura appl., 1937, [iii], **12**, 12—10).—Discrepancies between the vals. given by the two methods cannot be correlated with the protein content of the samples, but may depend on the particular proteins present and position of the isoelectric point.

F. R. G.

Action of diphtheria toxin on chloride concentration of blood. F. ADDARI and F. GOTTDENKER (Klin. Woch., 1937, **16**, 568—569).—After poisoning with diphtheria toxin the Cl′ concn. in the blood of guinea-pigs diminishes similarly to that in the case of adrenalectomised animals. The lowest level was generally reached in 24—36 hr., and persisted until the death of the animal.

F. W. L.

Choline-esterase in toxæmia. B. B. DIKSHIT and H. S. MAHAL (Quart. J. Exp. Physiol., 1937, **27**, 41—48).—Modifications in the biochemical method of assay of blood-choline-esterase are described, allowing closer comparison with the pharmacological assay using frog's rectus abdominis. During the toxæmia produced in guinea-pigs by inoculation with *B. pestis*, blood-choline-esterase is lowered, but returns to normal if the animals survive the infection. Similar results were obtained on one human subject, using a large dose of Haffkine's plague vaccine.

T. S. G. J.

Disappearance of acetylcholine in blood and cerebrospinal fluid. H. ALTENBURGER (Klin. Woch., 1937, **16**, 398—399).—The destruction of acetylcholine in cerebrospinal fluid is about 250 times slower than in blood. No differences from the normal rates were found in cases of Parkinsonism or of epilepsy.

F. W. L.

Action of acetylcholine on intestinal lymph production. H. G. KÖNIGES and M. OTTÓ (Quart. J. Exp. Physiol., 1937, **26**, 319—329).—The pressure was measured with a micro-manipulator in the capillaries and central lymph duct of the villi of the jejunum of the cat (narcotised with dial). The colloid osmotic pressure of the blood in the mesenteric artery and vein and of the thoracic lymph was also determined. Simultaneous records of capillary pressure, carotid pressure, and lymph flow were made. The effects of intravenous injection of eserine (1 mg.) and acetylcholine (0·01—0·1 μg.) were examined. In a typical series conditions of blood pressure and colloid osmotic pressure in the villi are such as to permit filtration and reabsorption, so that the lymph appearing in the thoracic duct is the resultant of these processes. Acetylcholine causes an increase in the capillary blood pressure and a proportional increase in lymph flow, parallel with the fall in the carotid blood pressure. The theory of the propulsion of lymph flow by movement of villi is discounted. Acetylcholine is regarded as a physiological lymph producer.

T. S. G. J.

Choline-esterase content of blood in myasthenia gravis. E. STEDMAN and W. R. RUSSELL (Biochem. J., 1937, **31**, 1987—1991).—The total choline-esterase contents of myasthenic and of certain pathological bloods are below that of normal blood. The myasthenic blood is distinguished from the other groups in that the serum content is below, and the corpuscle content approx. equal to, normal vals. The distribution of the enzyme between serum and corpuscles appears therefore to be disturbed. In two cases, striking remissions of the disease were associated with a marked diminution of the enzyme content of the corpuscles.

P. W. C.

Ascorbic acid content of the lymphatic organs. G. DE LUDANY and L. ZSELYONKA (Compt. rend. Soc. Biol., 1937, **126**, 198—199).—The ascorbic acid content of the lymphatic organs of the dog, especially the lymphatic ganglia and the tonsils, is high.

H. G. R.

Absorption spectra of opsonised and non-opsonised quartz surfaces. A. LEDOUX (Compt. rend. Soc. Biol., 1937, **126**, 426—427).—The protein material adhering to quartz discs after immersion in opsonising and non-opsonising plasma had fundamentally the same absorption spectrum.

H. G. R.

"Capillary analysis" of alexin. J. ROBERT (Compt. rend. Soc. Biol., 1937, **126**, 437—439).—The "capillary analysis" method of Bier is due to concn. of the serum in the upper portion of the test paper.

H. G. R.

Determination of the amino-groups in the proteins of human serum and in hæmoglobin. W. L. DULIÈRE (Compt. rend. Soc. Biol., 1937,

126, 442—444).—The vals. for the NH_2-N in serum-protein and in hæmoglobin by the Van Slyke method were 1·2 and 1·1%, respectively, compared with vals. of 0·635 and 0·4—0·62%, respectively, by Sörensen's method (A., 1936, 746). Reasons are given for accepting the latter. H. G. R.

Substances quantitatively carried down with the serum-proteins in trichloroacetic acid precipitation and in ultrafiltration. Cholesterol and bilirubin. W. L. DULIÈRE and R. MINNE (Compt. rend. Soc. Biol., 1937, **126**, 440—441).—Cholesterol and bilirubin are completely removed from serum by pptn. with trichloroacetic acid or by ultrafiltration. Cholesterol is not completely removed from the clot by centrifuging serum with 2 vols. of alcohol and is quantitatively pptd. from alcohol solution by several vols. of 10% aq. trichloroacetic acid. H. G. R.

Determination of blood-p_H by the glass electrode. VI. Applicability of the hydrogen electrode to p_H determinations of oxygenated blood. H. YOSHIMURA and T. FUJIMOTO (J. Biochem. Japan, 1937, **25**, 493—518; cf. A., 1936, 1530).—The H_2 electrode is applicable to oxygenated whole blood (goat, horse) at 15° but not at 37° owing to increased glycolysis. With oxygenated, hæmolysed blood, the p_H val. obtained is above that by the glass electrode by 0·06. With rabbits, but not other animals or man, the H_2 electrode is applicable at body-temp. to plasma separated at 20—25°. The p_H of plasma of various animals separated at 10—15° is above that of the whole blood, both being measured at the body-temp., by 0·02—0·11; this is due to differences in the temp. coeffs. of p_H of plasma and whole blood. F. O. H.

Titrimetric determination of the alkaline reserve of whole blood. W. L. DULIÈRE (Compt. rend. Soc. Biol., 1937, **126**, 258—261).—CO_2 is displaced from the blood with H_2SO_4 and collected in standard NaOH. H. G. R.

Acid–base balance of the blood in migraine. E. MUNTROYLER, V. C. MYERS, C. T. WAY, and W. H. DANIELSON (J. Lab. Clin. Med., 1937, **22**, 877—880).—There is no change of the acid–base balance of serum either during or between migraine attacks. The blood-cholesterol and icteric index may be slightly elevated in migraine, although the levels have no relation to the presence or absence of attacks. T. H. H.

p_H of human blood-plasma in respiratory and cardiac disease. C. SHISKIN (Lancet, 1937, **233**, 1191—1193).—The p_H of human blood, determined by a colorimetric method, was considered to be slightly increased in pulmonary tuberculosis and chronic pulmonary suppuration, and slightly lowered in mitral and aortic disease. C. A. K.

Changes in silkworm blood-plasma during metamorphosis. M. FLORKIN (Arch. int. Physiol., 1937, **45**, 17—31).—Changes in glycogen, lipins, water, and CO_2 occur at different stages of the life of the silkworm. C. E. B.

Composition of blood-plasma in adult insects. M. FLORKIN (Arch. int. Physiol., 1937, **45**, 6—16).—In *Hydrophilus pincus* and *Bombyx mori* the concns. of blood-protein and -glucose are of the same order as in decapod crustacea. The non-fermentable reducing substances, uric acid, and NH_2-acids are all very high. The urea content of the blood-plasma of *Hydrophilus* is similar to that of decapods. Its blood contains O_2 and about 73—89 vol.-% of CO_2. C. E. B.

Protein, uric acid, and total carbon dioxide in insects' blood-plasma. M. FLORKIN (Arch. int. Physiol., 1937, **45**, 241—246).—The blood-protein increases in the species Orthoptera, Lepidoptera, Coleoptera, Hymenoptera. In larvæ and nymphs it varies with the age. In *Bombyx mori* it reaches a max. of 5·5% at the end of the spinning stage and falls to 2% at hatching. Uric acid is higher in insects than in other invertebrates. The CO_2 is not characteristic, but the hydrophile has an exceptionally high internal environment of CO_2 which is related to its special respiratory function. C. E. B.

High urea concentration in the red blood cells of *Sipunculus*. M. FLORKIN and R. HOUET (Arch. int. Physiol., 1937, **45**, 125—127).—Using urease, followed by Conway's method (A., 1933, 654) for the measurement of NH_3, the presence of a considerable amount of urea in the red blood corpuscles was confirmed. The plasma and cœlomic fluid contained no urea. C. E. B.

Source of heart-glycogen. J. Y. BOGUE, C. L. EVANS, and R. A. GREGORY (Quart. J. Exp. Physiol., 1937, **27**, 27—39).—The heart-oxygenator circuit was used in dogs. Combined with heavy mechanical work, adrenaline produces rapid depletion of glycogen and the heart suddenly fails when the glycogen is used up. If depletion is stopped short of failure there is no gluconeogenesis on recovery, even after addition of lactate; addition of glucose does, however, cause resynthesis of glycogen. Addition of lactate and glucose leads to a smaller resynthesis of glycogen. Lactate depresses the sugar usage of the heart. Addition of glucose or lactate before addition of adrenaline does not hinder glycogen depletion. T. S. G. J.

Lactic acid metabolism in auricular fibrillation. F. ADDARII (Arch. int. Pharmacodyn., 1937, **57**, 133—138).—In the heart–lung prep. (dog) artificially produced auricular fibrillation is associated with coronary dilatation and variable effects on lactic acid utilisation. D. T. B.

Energy liberation at constant diastolic fibre length in the tortoise heart. L. F. MOLDAVSKY and M. B. VISSCHER (J. Physiol., 1937, **91**, 23—30).—Measurements of O_2 consumption (Decherd and Visscher's modification of Stella's device), ventricular vol. (heart chamber connected with calibrated tambour), and arterial pressure on the tortoise heart show that (contary to the views of Stella) at const. diastolic ventricular vol. the energy liberation is independent of the max. systolic pressure; the latter was altered by changes in the peripheral resistance and the diastolic vol. kept const. by adjustments in venous filling pressure (perfusion fluid 1 part of turtle's blood in 10—20 parts of Ringer's fluid). After contracting against higher pressures the

ventricle comes to an apparent systolic vol. plateau at a level higher than the vol. of the empty ventricle; considerable time is required for the ventricle to empty itself against minimal pressures in such circumstances; this property of heart-muscle was not taken into account by Stella, and probably accounts for his different results. A. C.

Electrical potentials of the heart of the chick embryo. J. A. E. EYSTER, M. R. KRASNO, and J. P. HETTWER (Amer. J. Physiol., 1937, **120**, 173—178).—The chick embryos were detached from the egg, floated free in Ringer's solution, mounted on a circular glass disc 60 mm. in diameter, and placed in a moist chamber maintained at 38°. The ground lead to a two-stage direct-coupled amplifier was connected with a non-polarisable electrode of the $Zn–ZnSO_4$ type at the edge of the disc; the grid lead of the amplifier led to a similar electrode furnished with a fine thread wick. This electrode was placed in contact with any desired portion of the heart or surrounding field by means of a micro-manipulator. In the 40-hr. stage the heart was left *in situ*. In later stages up to the 72-hr. stage when the cardiac tube had become S-shaped, the arterial end was cut free, the tube straightened, and the end held by a glass point attached to an arm of the micromanipulator. The potential–time curves were similar in all essential details to those recorded from the adult vertebrate heart or from the field surrounding it. The potential changes showed clearly that the deposition of electrical charges in the heart responsible for these potentials accords with that of the adult heart. The orientation of electrical charges in the adult heart is thus present in the primitive cardiac tube when it first acquires the property of contractility and before histological or gross anatomical differentiation has occurred. M. W. G.

Rhythmic contraction in strips of the heart of *Aplysia fasciata*. A. JULLIEN (Arch. int. Physiol., 1937, **45**, 189—204).—All parts of the myocardium of the ventricle can contract rhythmically, but strips which run transversely can inhibit the contraction. These strips can be put out of action by atropine. Experimental arrest by acetylcholine, however, is not prevented by atropine. A high ratio of Na + K/Mg + Ca always alters the rate, later the force, and sometimes the tone of the muscle. The rhythmicity of different strips shows a relation to the situation of the strips in the ventricular wall. C. E. B.

Study of the electrocardiogram. A. WEBER (Z. klin. Med., 1937, **132**, 153—157).—A review. T. S. G. J.

Physiological origin of automatic action. L. ASHER (Verh. schweiz. Physiol., 1937, **12**, 9).—Action potentials in the frog's sinus venosus can be observed for some hours during perfusion with K-free Ringer's solution after all visible contraction has ceased. When they also eventually cease they reappear on dipping the sinus into a prep. made by rubbing another sinus in K-free Ringer's solution. R. M. M. O.

Spontaneous changes of normal electrocardiograms in dogs. I. MAINZER and M. KRAUSE (Cardiologia, 1937, **1**, 148—158).—The electrocardiogram of normal dogs in the standing position is valueless owing to electrical disturbances set up by muscular movements; in the sitting position it is as const. as in man in the dorsal decubitus. The variations of the electrocardiogram in the right or left lateral position, found on different days on the same and different animals, are due to variations in mediastinal rigidity. A. S.

Action of phloridzin on the electrocardiogram. F. MAINZER, M. KRAUSE, and W. JOËL (Arch. int. Pharmacodyn., 1937, **57**, 94—98).—After phloridzin poisoning in the dog changes in the electrocardiogram occur similar to those described in beri-beri and Addison's disease. The *R* wave is increased in all three leads. The changes are attributed to altered metabolism of the heart-muscle fibres. Dilatation of the heart occurs. D. T. B.

Extra waves in the electrocardiogram. B. KISCH (Cardiologia, 1937, **1**, 17—25).—Typical positive waves, hitherto not described, occur occasionally in the human electrocardiogram. Two extra waves may occur between *P* and *Q*, one immediately following *P* and the other shortly preceding *Q* or (in the absence of *Q*) *R*. There may be another extra wave between *S* and *T* or, if *S* is absent, between *R* and *T*. A. S.

Electrogram of right auricle and left ventricle. A. LUISADA, A. RUBINO, and C. CANELLA (Cardiologia, 1937, **1**, 280—291).—Electrograms of the sinus region of the heart in anæsthetised dogs with opened or intact chest were obtained by introducing a dipolar stomach tube through the right external jugular vein into the right auricle of the heart. There is a polyphasic auricular complex, preceded by a small bi- or poly-phasic complex, and followed by a ventricular complex. The small bi- or poly-phasic waves are assumed to be due to the action of the sinus of the heart. A. S.

Demonstration of small branches of the left bundle of His supplying the interventricular septum. I. MAHAIM and A. BENATT (Cardiologia, 1937, **1**, 61—73).—In man there are very small branches from the left bundle of His which run to the muscle of the intraventricular septum; they arise high up near the bifurcation of the main bundle. These connexions may account for some rare signs in cases of branch bundle lesion. A. S.

Normal and pathological physiology of the conducting tissue of the heart. C. I. ROTHBERGER (Cardiologia, 1937, **1**, 234—250).—A review. A. S.

Localisation of branch bundle block. C. LIAN and V. GOLBLIN (Arch. Mal. Coeur, 1937, **30**, 787—795).—The terminology of branch bundle lesions has to be changed on the basis of clinical and electrocardiographic evidence. So-called right bundle-branch lesions are actually blocks of the left bundle of His, and vice versa. It is proposed to call lesions of the bundle of His "septo-ventricular blocks," and to distinguish whether they are predominantly left- or right-sided. A. S.

The newer electrocardiogram denoting right bundle-branch block. W. EVANS and H. M. TURNBULL (Lancet, 1937, **233**, 1127—1131, 1184—1186).—

12 cases showing a new distinctive type of electrocardiogram denoting a lesion of the right branch of the bundle of His are described. A detailed histological examination of one case showed complete anatomical interruption of the right branch and partial destruction of the left branch. C. A. K.

Prolonged ventricular standstill in Stokes-Adams disease. H. HERMANN, R. FROMENT, A. GONIN, and I. MAHAIM (Arch. Mal. Coeur, 1937, **30**, 753—786).—Periods of complete ventricular arrest were observed in a patient, lasting up to 2 min. During the first 30 sec. breathing was intensely stimulated; subsequently it gradually slowed down. This is attributed to the fall of blood pressure first reflexly stimulating breathing via the carotid sinus nerves; the central anæmia subsequently depressed the respiration. Breathing stopped in 1 min. A short-lived arterial hypertension accompanied the reappearance of ventricular activity, due to an intense reflex and anoxic peripheral vasoconstriction, which secondarily produced reflex slowing of the heart. Breathing was still absent during that period. A. S.

Clinical observations on the dynamics of ventricular systole. IV. Pulsus alternans. W. N. KATZ and H. S. FEIL (Amer. J. med. Sci., 1937, **194**, 601—610).—Optical registration methods were employed to study the dynamics of ventricular systole in 5 patients with pulsus alternans. Alternation of the pulse was associated with alternation in the intensity of the heart-sounds. Discordant alternation of the isometric and ejection phases were also shown: in small beats the isometric phase was relatively prolonged while ejection was relatively shortened; in large beats the reverse occurred. The pulse gradient was less rapid in the smaller than in the larger beats. No alternation in the electrocardiograms was found. Changes in initial volume and tension can help to initiate pulsus alternans; once established, alternate variations in systolic residue occur which alternately increase and decrease the initial tension and vol. and so help to perpetuate the phenomenon. R. L. N.

Myocœdema heart disease. Treatment and radiographic changes. C. EVANS (Lancet, 1937, **233**, 1300—1302). C. A. K.

Relation of tone and contraction to polarisation in the heart-muscle of the snail. A. ARVANITAKI and H. CARDOT (Arch. int. Physiol., 1937, **45**, 205—240).—In the snail's ventricle catelectrotonus is associated with increased tone and anelectrotonus with decreased tone. These reactions were studied with relation to the tonus before polarisation, the duration and intensity of the current, and the slope of progressive currents. Anelectrotonus lengthens the cardiac cycle and finally stops the heart in diastole. Tone and conduction seem to depend fundamentally on surface polarisation. Excess of alkaline-earth ions acts like a strong anelectrotonus in an alkaline solution. C. E. B.

Vagal control of ventricle. F. JOURDAN and R. FROMENT (Compt. rend. Soc. Biol., 1937, **125**, 915—917).—After division of the auriculo-ventricular bundle stimulation of the left vagus can still diminish the rate of the ventricle. D. T. B.

Effects of choline compounds on auricle. A. SACHS (Cardiologia, 1937, **1**, 74—87).—The threshold doses (in μg.) required to diminish the force of contraction of the isolated auricle in rabbits were acetylcholine 0·1, doryl 0·25, choline chloride 1, cholazyl 50, diluted in 40 c.c. of fluid. Smaller doses increased the force of contraction. The action of these compounds does not depend on the abs. amount of substance present in the suspension fluid but on the concn. inside the tissue. The auricular strip of the rabbit's heart is useful for the assay of unknown acetylcholine-like substances in moderate but not in very small concns. A. S.

Phasic blood flow and its determinants in the right coronary artery. D. E. GREGG (Amer. J. Physiol., 1937, **119**, 580—588).—Using optical manometers of adequate frequency, phasic blood flow and its determinants in the right coronary artery of the dog were studied by the method of differential pressure curves. The diastolic ordinate val. was similar to that of the left coronary artery, but the systolic val. was generally lower. The max. systolic resistance to flow in the right ventricle exceeded the right intraventricular pressure by varying amount. Based on equiv. time intervals of systole and diastole, the vol. flow during systole was generally above that during diastole. Both systolic and diastolic flow were reduced if right intraventricular pressure was gradually increased, the cause of both flow reductions being the elevation of systolic coronary resistance. M. W. G.

Action of irradiated blood on heart and blood vessels. A. N. KABANOV, R. I. ROSINA, and P. A. TICHOMIROVA (Bull. Biol. Méd. exp. U.R.S.S., 1936, 288—289, 290—291).—The blood of a rabbit irradiated by a Hg lamp stimulates the isolated heart, and constricts the vessels of the perfused rabbit's ear. J. WA.

Gaseous metabolism as test of cardiac efficiency. H. VON PEIN (Z. klin. Med., 1937, **132**, 227—245).—In compensated heart disease, O_2 use is normal, except in morbus cœruleus. In uncompensated heart disease there is primarily an increase in relative O_2 debt, but also an increase in abs. O_2 use and O_2 debt. The alteration in gas metabolism on stair climbing affords a functional test by which it is possible early to diagnose an insufficient capacity for work. T. S. G. J.

Heart rate and cardiac efficiency. W. BORGARD (Arbeitsphysiol., 1937, **9**, 505—513).—A discussion of the effect of exercise on O_2 usage, heart rate, and output in trained and untrained individuals and in cardiac cases based on very few original observations. E. J. W.

Application of cardiac output studies to clinical problems. A. GROLLMAN (Cardiologia, 1937, **1**, 40—45).—A review. A. S.

Changes in blood volume, venous pressure, and blood velocity rate in chronic congestive heart failure. J. G. GIBSON, 2nd, and W. A. EVANS, jun. (J. Clin. Invest., 1937, **16**, 851—858).—The plasma vol., red cell vol., and total vol. of the

blood were measured under basal conditions as single estimations in 99 patients with varying degrees of congestive heart failure; as serial observations in 13 cases during the course of restoration of compensation in congestive heart failure; in 3 cases in whom the course of restoration was not smooth, and in 5 patients who died. The plasma vol. was measured by an azo-dye (Evans-blue) method, the dye concn. being determined in serial samples of blood serum by a spectrophotometer method. The total blood vol. and red cell vol. were calc. from hæmatocrit val. of venous blood and the plasma vol. The existence of the so-called "plus" and "minus" types described by Wollheim and others was not confirmed, and it is suggested that the "minus" type of failure is a misconception arising from errors in the techniques employed. In heart disease the change from the compensated to the decompensated state was accompanied by a progressive increase in the vol. of plasma and, rather more, of the red cells, so that there was a slight concn. of the blood. The average increase in blood varies as the average increase in venous pressure and decrease in circulation time. During recovery from congestive heart failure there is a decrease in both plasma and cell vol., the decrease in plasma in most cases at first being more rapid than that of the red cells and so results in some blood concn. Later the proportion of red cells to plasma returns to normal and the decrease in total blood vol. parallels the clinical improvement. In no case was any increase in blood vol. found during recovery, but relapses are accompanied by maintained elevation of or further increase in blood vol. C. J. C. B.

Determination of approximate cardiac output in man. J. S. Donal, jun. (J. Clin. Invest., 1937, **16**, 879—887).—The cardiac output of normal and clinical subjects was estimated from the determination of metabolism and of the O_2 and CO_2 contents of two samples collected during a single rebreathing procedure according to the formula: cardiac output = (normal O_2 consumption — O_2 consumption during the rebreathing) ÷ (normal arterial O_2 content — arterial O_2 content during the rebreathing). The possible errors inherent in the assumptions and technique were found unimportant. The results in estimations on the same normal and clinical subjects by this method, by the ethyl iodide method of Starr and Gamble, and by the C_2H_2 method of Grollman were in only fair agreement. In 7 cases the method described agreed more closely with the ethyl iodide results, and in 3 cases with the C_2H_2 results. C. J. C. B.

Lipiodol for determination of blood velocity. H. Homma (Mitt. Grenzgeb. Med. Chir., 1937, **44**, 591—603).—Venous velocity in dogs was measured by introducing minute lipiodol droplets into a vein of a leg, with *X*-ray determination of the rate of propagation between lead marks on the limb. The velocity is diminished under ether or chloroform anæsthesia, enhanced by muscular movements, increased rate of respiration, and increased skin temp. Blood velocity seems to depend on pulse rate, not on blood pressure. A. S.

Circulation time after exercise. J. B. Milovanovitch and L. Stanoyevitch (Compt. rend. Soc. Biol., 1937, **126**, 547—549).—The circulation time after exercise was 3·8 sec. shorter in athletic than in untrained subjects. D. T. B.

Postural changes in cardiac output and respiration in man. J. McMichael (Quart. J. Exp. Physiol., 1937, **27**, 55—72).—Modifications in the technique of sampling in the determination of cardiac output by the C_2H_2 method, to reduce the possibility of vitiation of the results by the recirculation of blood containing C_2H_2, are described. The use of the Van Slyke manometric apparatus is advised. In normal subjects, there is an increase in arterio-venous O_2 difference in the erect as compared with the reclining position. There is a decrease in cardiac output in the erect position, sometimes masked by the increase in O_2 consumption. In resting subjects on a tilting table, sudden change from the horizontal to the erect position increases the cardiac output. Calculations by the increase in O_2 uptake during the first 30 sec. and by the C_2H_2 method show close agreement. The pulmonary ventilation per 100 ml. of O_2 consumed is greater in the erect that in the reclining position. T. S. G. J.

Post-mortem elasticity of human aorta. S. L. Wilens (Amer. J. Path., 1937, **13**, 811—834).—The aortas of 123 adults which showed microscopically no evidence of disease other than arteriosclerosis were taken and transverse and longitudinal strips from the ascending, upper descending thoracic, lower thoracic, and upper and lower abdominal portions were examined. The elasticity of each strip was measured by clamping one end and attaching 300 g. for 1 min.; the stretch length was measured, 295 g. were removed, and the length was taken again after 1 min. It was found that elasticity varied with age. In young adults the elasticity was approx. equal in all areas and in both directions. As age advanced, the elasticity was reduced first and proceeded more rapidly in those areas that were most rigidly attached *in situ* and the longitudinal plane. The development of intimal plaques was not directly related to the loss of elasticity. The earliest intimal lipoid deposits were in those areas which were most fixed *in situ*. It is suggested that the lipoid material does not necessarily remain at its point of entrance into the intima, but by the movements of the vessel tends to lodge in the least elastic and least movable portions. C. J. C. B.

Changes in blood vessels (capillary fragility) with inflammation. E. Zander (J. Exp. Med., 1937, **66**, 637—651).—The production of capillary hæmorrhage by the application of suction to the skin surface is used as a means of determining capillary fragility. In rabbits the normal time of suction (—70 mm. Hg) required to produce hæmorrhage over the area is about 8 min. Inflammation produced by bacterial toxins or irritants caused changes in capillary fragility. Immediately after injection capillary fragility is markedly diminished and the skin may withstand 100 min. suction without hæmorrhage occurring. After about 12 hr. fragility is increased, hæmorrhage occurring after a few min. suction. This increase of the capillary fragility may persist for a week or so. With allergic inflammation the preliminary decrease in fragility is less marked

and lasts for a shorter period. The prepared area for the Schwartzman reaction shows increased capillary fragility. A. C. F.

Estimation of subcutaneous tissue pressure by a direct method. G. E. BURCH and W. A. SODEMAN (J. Clin. Invest., 1937, **16**, 845—850).—Employing a simple direct manometric method, in ten normal individuals mean pressures at heart level of 17·9—37·1 mm. of H_2O in the subcutaneous tissues of the dorsum of the hand and foot, volar surface of the forearm, and the pretibial area were found. The tissue pressure in the dorsum of the foot was increased by the erect position and further by wt.-bearing. Increase in venous pressure up to 1 hr. has only a slight effect, but in congestive heart failure with prolonged high venous pressure the tissue pressure is greatly increased. In 10 patients with increasing cardiac œdema, the tissue pressure was increased; as the œdema decreased so did the tissue pressure. C. J. C. B.

Circulatory effects of the venom of the Indian cobra (*Naia naia*) in cats. W. FELDBERG and C. H. KELLAWAY (Austral. J. Exp. Biol., 1937, **15**, 159—172).—In cats under dial anæsthesia, intravenous injection of cobra venom (0·25—0·5 mg. per kg.) causes an immediate steep fall in systemic pressure; death may occur within a few min. If recovery of the blood pressure takes place, there is a secondary gradual fall, resulting eventually in death. The immediate steep fall of systemic pressure is accounted for by obstruction in the pulmonary circulation; peripheral vasodilatation, constriction of the liver vessels, and heart failure do not contribute to it. This fall is accompanied or preceded by a rise of pressure in the pulmonary artery and a fall of pressure in the pulmonary vein. Venom injected into the femoral artery causes immediate vasoconstriction in the hind limb. The late gradual fall of systemic pressure is accounted for by fluid loss from the circulation, probably associated with peripheral vasodilatation, hæmorrhagic œdema of the lungs, and, in some cases, failure of the heart action. D. M. N.

Diffuse vasotatic reflex. F. Y. HSU and L. W. CHU (Chinese J. Physiol., 1937, **12**, 37—50).—Vasotatic reflexes are those brought about by changes of pressure in the vascular system. In the anæsthetised dog the vol. of the perfused spleen, intestine, kidney, and leg, connected to the body by nerves only, increased on raising arterial pressure in the body after the sinus and aortic nerves were cut. The reflex persisted after exclusion of the circulation to the abdominal viscera, and for a short time after cutting the cervical cord. A fall of perfusion pressure in the organs caused a rise of arterial pressure in the body. These reflexes were feebler than those from the carotid sinus and aorta. N. H.

Vasomotor responses of the kidney. F. Y. HSU and L. W. CHU (Chinese J. Physiol., 1937, **12**, 109—116).—The urine flow and vol. of the kidney were recorded in anæsthetised dogs, in which vasomotor reflexes were brought about by clamping the carotids. The denervated kidney passively followed the arterial pressure changes; a reflex rise of arterial pressure caused a decrease or no change in the vol. of the innervated kidney. Extreme diuresis abolished the kidney reflex. The viviperfused kidney responded to an increase of perfusion pressure, brought about by adrenaline, by an increase in vol. and urine flow. On rebreathing expired air, the kidney constricted; this was not due to a direct action of the blood on the kidney vessels. The vol. of the leg and spleen reacted in a similar way. N. H.

Latent period of white line. E. DICKER (Compt. rend. Soc. Biol., 1937, **125**, 1030—1032).—The latent period of the white line produced by mechanical stimulation of the skin is increased in old people and not related to the level of arterial blood pressure. D. T. B.

Shock, its mechanism and pathology. V. H. MOON (Arch. Path., 1937, **24**, 642—663).—A general review. C. J. C. B.

Action of vagotonin on adrenaline splenocontraction. C. FRANCK and R. GRANDPIERRE (Compt. rend. Soc. Biol., 1937, **126**, 347—350).—Vagotonin intensifies the splenic vasoconstriction caused by adrenaline. D. T. B.

Vasomotor action of pineal extracts. J. MALMÉJAC and V. DONNET (Compt. rend. Soc. Biol., 1937, **126**, 370—372).—Pineal extracts dilate the denervated limb and kidney but constrict the innervated perfused kidney. D. T. B.

Depressing effect of alcohol on carotid sinus. J. MONIZ and M. RODRIGUES CARDOSO (Compt. rend. Soc. Biol., 1937, **126**, 599—601).—The mechanical and chemical sensibility of the carotid sinus disappears after injection of alcohol in the dog. D. T. B.

Paradoxical effect of intravenously injected sodium cyanide in small doses on heart rate and blood pressure in dogs. M. MENDLOWITZ and G. SCHAUER (Amer. J. Physiol., 1937, **119**, 749—754).—Intravenous injection of 0·5% NaCN in dogs (nembutal anæsthesia) produces bradycardia and hypertension; after denervation of the heart it produces transient tachycardia and hypotension. Analysis of these results by suitable forms of nerve section and perfusion of the isolated heart showed that the hypertension represents a reflex vasoconstriction and the bradycardia a reflex augmentation of vagal tone and inhibition of sympathetic accelerator tone. The hypotension represents a direct vasodilatation and the tachycardia a direct cardiac stimulation. In the normal dog the reflex action of the drug on heart rate and blood pressure tends to mask the direct action. The paradoxical direct effects are attributable to a transient depression of tissue oxidation by the cyanide radical. M. W. G.

Hypertensive action of acetylcholine. U. LOMBROSO and A. BONSIGNORE (Arch. Sci. biol., 1937, **23**, 22—30).—"933 F" often prevents the rise of blood pressure usually produced by acetylcholine in atropinised dogs. R. S. CR.

Blood-pressure studies in small animals. R. A. WOODBURY and W. F. HAMILTON (Amer. J. Physiol., 1937, **119**, 663—674).—Pressure pulse contours with systolic and diastolic blood-pressure vals. were taken from the mouse, rat, canary, sparrow, robin,

pigeon, frog, turtle, and carp, and compared with curves from larger animals. The blood-pressure level was characteristic of the species and not of the size of the animal; it is higher in small birds than in small mammals, the same in mice and men, higher in dogs, and lower in cold-blooded animals. The vol. elasticity coeff. of the arterial system varied with pressure in a const. manner in any individual animal even though marked changes were made in the pressure and in the peripheral vascular system. All animals studied showed a similar relationship. An equation is given describing the approx. relationship between the pressure and the vol. elasticity coeff. In warm-blooded animals the rate at which arterial pressure descends during diastole was inversely correlated with the size of the animal, the relative vol. of the "Wind Kessel," and with the length of diastole. It was directly correlated with the pressure at the time of measurement in all animals. In a single diastole the logarithm of the rate of descent had a linear relationship with pressure. M. W. G.

Changes in volume of lower extremities under various conditions. H. LOOKE (Arbeitsphysiol., 1937, **9**, 496—504).—A special foot plethysmograph is described and an additional technique using plaster-of-Paris casts for determining changes in leg vol. On changing from the horizontal to the vertical posture there is a rapid initial increase in leg vol. and a slower subsequent increase until constancy is reached after about 2 hr. This increase in leg vol. on standing erect was prevented by any form of exercise using the leg muscles, and disappeared rapidly if such exercise was subsequently taken. During pregnancy the increase in leg vol. on standing was much greater. E. J. W.

Effect of alcohol in cerebral vessels. C. B. THOMAS (Arch. Neurol. Psychiat., Chicago, 1937, **38**, 321—339).—Intravenous and intracarotid injections and local applications of EtOH in anæsthetised and unanæsthetised rabbits and cats dilated the pial arteries. The dilatation was independent of alteration of general arterial pressure. During pial dilatation the flow through the pial veins was more rapid and the colour of the vein changed from blue to red. The blood flow through the brain and the cerebrospinal fluid pressure were increased. The greater extent of dilatation following intracarotid injection as compared with intravenous injection further indicates that the change is brought about by a local mechanism. D. P. C. L.

Anoxæmia and cerebral circulation. L. BINET, R. CACHERA, R. FAUVERT, and M. V. STRUMZA (Compt. rend. Soc. Biol., 1937, **126**, 166—169).—O_2 lack dilates the pial vessels in chloralosed dogs. D. T. B.

Factors affecting vascular tone. W. B. CANNON (Amer. Heart. J., 1937, **14**, 383—398).—A review. C. A. K.

Flow and concentration of blood as influenced by ergot alkaloids. W. G. LENNOX and H. C. LEONHARDT (Ann. Int. Med., 1937, **11**, 663—670).—The influence of ergotamine, ergonovine, and adrenaline on the flow and concn. of blood in the vessels of the arm was studied in humans by measuring the changes in concn. of venous blood gases. All increased the rate of flow but only the first two concentrated the blood. These factors may explain their action in migraine. C. A. K.

Effect of cold on blood pressure. H. BRADA and L. FEIL (Wien. Arch. in Med., 1937, **31**, 121—128).—In normal subjects immersion of one hand in ice-water caused a rise in blood pressure of 10 mm. Hg in 1 min. Hypertensive patients showed a rise up to a max. of 50 mm. Hg, or, less commonly, a fall. The mechanism of these reactions is not known. A. S.

Chronic 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).—After complete sympathectomy in dogs partial occlusion of the renal artery still causes chronic hypertension. This is consequently of peripheral and humoral origin. D. T. B.

Effect of section of anterior spinal nerve roots on experimental hypertension due to renal ischæmia. H. GOLDBLATT and W. B. WARTMAN (J. Exp. Med., 1937, **66**, 527—534).—In dogs the production and persistence of hypertension following clamping of the renal arteries were not affected by section of the anterior roots from the sixth thoracic to the second lumbar inclusive. It is concluded that the splanchnic vasomotor area is not largely concerned with the production or maintenance of hypertension in these cases, and that the hypertension is not a reflex response to ischæmia of the kidney. A. C. F.

Hypertension produced by constriction of the renal artery in sympathectomised dogs. N. E. FREEMAN and I. H. PAGE (Amer. Heart J., 1937, **14**, 405—414).—Compression of the renal arteries produced hypertension in 7 dogs after total sympathectomy, and in 1 dog after total sympathectomy plus cardiac denervation. There was no evidence of increased adrenaline secretion. Injection of 3 mg. of ergotamine tartrate raised the blood pressure slightly in 2 dogs with intact sympathetic system. The plasma vol. was unchanged in 1 normal and 2 sympathectomised dogs after clamping renal arteries. It is concluded that the hypertension produced by compression of the renal arteries is not due to increased peripheral resistance of reflex sympathetic origin, or reflex changes in cardiac activity, or an increase of plasma vol. C. A. K.

Arterial hypertension from obstruction of renal circulation. E. DICKER (Compt. rend. Soc. Biol., 1937, **125**, 1046—1047).—Blocking the renal artery leads to hypertension after denervation and decapsulation of the kidney. The hypertension is not due to products retained in the blood. D. T. B.

Physiological effects of extensive sympathectomy for essential hypertension. E. V. ALLEN and A. W. ADSON (Amer. Heart J., 1937, **14**, 415—427).—In 45 patients with essential hypertension a bilateral subdiaphragmatic, extra-peritoneal resection of the splanchnic nerves, coeliac ganglia, and the upper two lumbar sympathetic ganglia was performed. About 70% of the patients benefited

clinically and in most of these there was a fall of blood pressure; it was unchanged in 45%, many of whom could now be recognised as unsuitable for operation. There was a diminished blood-pressure response to immersion of a hand in ice-water. Other signs of improvement are described. Following operation, a transient orthostatic hypotension and tachycardia occurred. C. A. K.

Rôle of the arteries in the peripheral resistance of hypertension and related states. E. T. OPPENHEIMER and M. PRINZMETAL (Arch. Int. Med., 1937, **60**, 772—782).—The average brachial-digital pressure gradient for patients with chronic hypertension was approx. the same as for those with normal or low blood pressure. In 4 patients with obliterative vascular disease the pressure gradient was increased, due to obstruction in the arteries resulting from org. changes. This increase, contrasted with the normal or decreased gradient of chronic hypertension, was considered to indicate that there is no increased resistance in the larger arteries in chronic hypertension. T. H. H.

Cholesterol-induced arteriosclerosis in rabbits with variations due to altered status of thyroid. F. R. MENNE, J. A. P. BEEMAN, and D. H. LABBY (Arch. Path., 1937, **24**, 612—625).—Rabbits were fed cholesterol in oil or pellets under normal conditions, following thyroidectomy, with I administration and with desiccated thyroid administration. The blood-cholesterol and basal metabolic rates were determined. Atherosclerosis was most easily produced in the rabbits on I or after thyroidectomy, less in the normal animals, and least in those given thyroid. The results appear to corroborate Leary's view that two factors are required for the development of atherosclerosis: (1) excess of cholesterol or cholesteryl esters in the blood and (2) the stress due to mechanical factors of circulation. C. J. C. B.

Paroxysmal hypotonia. F. KISCH (Cardiologia, 1937, **1**, 45—59).—A review.

Analysis of central and peripheral arterial pulses during Valsalva's experiment. K. WEZLER and R. KNEBEL (Z. Biol., 1937, **98**, 302—324).—Changes in form of the human arterial pulse during a voluntary increase of the intrathoracic pressure (Valsalva's experiment) are recorded (from the subclavian, carotid, femoral, and radial arteries) and analysed according to O. Frank's theory. It is concluded that, owing to the raised intrathoracic pressure, the elastic central arteries become unable to retain a considerable vol. of blood during the systole. The stroke vol. and output per min. of the heart (the latter in spite of increased heart rate) are reduced during Valsalva's experiment. Certain changes of the peripheral pulse (*e.g.*, dicrotic and hyperdicrotic radial pulse) are interpreted as due to a resonance between the (shortened) systole and the (lengthened) vibration period of the peripheral artery. B. K.

Interpretation of arterial elasticity from measurements of pulse wave velocities. I. Effect of pressure. J. M. STEELE (Amer. Heart J., 1937, **14**, 452—465).—The velocity of the arterial pulse wave in the dog and man was determined by the hot-wire sphygmograph method of Bramwell and Hill. In the dog, independent variation of systolic, diastolic, and pulse pressures showed that the pulse velocity varied directly as the diastolic pressure and was independent of systolic and pulse pressures. In cases of human arterial hypertension the pulse velocity is much increased, but by calculation of this velocity at 80 mm. Hg normal figures are obtained. This suggests that there are no changes in elasticity of the larger arteries in hypertension. C. A. K.

Development of terminal air passages in human lung. W. G. BARNARD and T. D. DAY (J. Path. Bact., 1937, **45**, 67—73).—A description of the terminal air passages is given based on 48 human fœtuses. Their epithelial lining begins to disappear towards the end of the 5th month and does not reappear. C. E. B.

Liberation of histamine from the perfused lung of the guinea-pig by bee venom. W. FELDBERG and C. H. KELLEWAY (J. Physiol., 1937, **91**, 2—3P).—The right lung was perfused from the pulmonary artery with Tyrode solution. The total output of histamine after the injection of five stings of bee venom corresponded with between 65 and 75% of the lung-histamine (unperfused left lung). The liberation of this histamine must be taken into consideration in explaining those symptoms of bee-venom poisoning which resemble the effects of histamine. A. C.

Myohæmoglobin at high altitudes. A. HURTADO, A. ROTTA, C. MERINO, and J. PONS (Amer. J. med. Sci., 1937, **194**, 708—713).—Blood studies and determinations of muscle-hæmoglobin by Whipple's method were made on 7 dogs born and raised at sea level, and 7 dogs born and raised at 12,300 ft. or over (barometric measure 485 mm. Hg or less). The animals at high altitudes showed typical blood changes and also an increase in the hæmoglobin content of the muscles. R. L. N.

Influence of the lungs on blood-lactic acid. H. ROSENBAUM (Arch. int. Physiol., 1937, **45**, 75—83).—Dogs anæsthetised with morphia and urethane inhaled gas mixtures poor in O_2, an anticoagulant being also used. The lactic acid content of the mixed venous blood was diminished during its passage through the lungs. C. E. B.

Production of artificial respiration by rhythmic stimulation of the phrenic nerves. R. A. WAUD (Nature, 1937, **140**, 849).—Rhythmic electrical stimulation of the exposed phrenic nerves was successfully used to produce artificial respiration in anæsthetised rabbits, during experiments with drugs affecting respiration. No circulatory changes occurred as in other methods of artificial respiration. C. A. K.

Tests of respiratory efficiency. M. N. J. DIRKEN and J. K. KRAAN (Klin. Woch., 1937, **16**, 634—636).—20 normal resting subjects breathed gas mixtures containing 21—13% O_2. Puncture blood from the finger was obtained in the arterial condition after immersion of the hand for 15 min. in water at 40—45°. When breathing air containing 17—21% of

O_2 the saturation of the finger blood was 94—98%; with 17% there was a definite fall and with 13% the average saturation was 75%. No subjective changes were felt, although with the lower val. cyanosis was often present. In 9 cardiac cases without lung involvement inhalation of 17% O_2 produced an O_2 unsaturation of 6—15% and in 9 others with signs of decompensation, an unsaturation of 10—30%. In one case with arterial under-saturation with room air the diminution (when 17% O_2 was inhaled) reached 56%. F. W. L.

Reflex thermic polypnœa. J. VLCEK (Compt. rend. Soc. Biol., 1937, **126**, 637—640).—Richet's view that heat polypnœa can be induced both reflexly and centrally was not confirmed in experiments on anæsthetised dogs. Cutaneous thermic stimulation only produces polypnœa if the blood temp. is simultaneously raised. D. T. B.

Decorticate polypneic panting in the cat. J. L. LILIENTHAL and F. J. OTENASEK (Bull. Johns Hopkins Hosp., 1937, **61**, 101—124).—In the acutely decorticate cat following withdrawal of ether anæsthesia there occurs spontaneously at normal body temp. polypneic panting, characterised by a rapid rate (100—300 per min.) and decreased amplitude of respiratory movements, and rhythmic movements of the tongue and labial commissures synchronous with respiration. The rate of panting is increased by raising the body temp. The neural centres requisite for polypneic panting lie within the caudo-dorsal portion of the diencephalon. Panting is distinct from sham rage and falls into the general class of release phenomena. T. F. D.

Peripheral regulation of respiration by carbon dioxide. M. N. J. DIRKEN and H. A. E. VAN DISHOECK (Pflüger's Archiv, 1937, **238**, 713—726).—A method is described by which a lung can be isolated in the rabbit, retaining its nervous connexion and receiving its vascular supply from the bronchial circulation; the animal goes on breathing spontaneously. A decrease in the CO_2 content of the isolated lung below 6—7% increases the frequency and diminishes the depth of respiration; increase above 7—8% has no effect on the respiration, but concns. of 80—100% have a stimulating action. The effects of low and very high CO_2 concns. disappear after section of the vagi. J. M. R.

Investigations into bronchial asthma. P. KALLÓS and W. PAGEL (Acta med. scand., 1937, **91**, 292—305).—In guinea-pigs rendered allergic, inhalation of the homologous antigen in the form of a fine spray produces bronchial asthma which resembles in every particular human asthma. Similarly inhalation of histamine or acetylcholine in the form of a spray produces the clinical symptoms of allergic asthma. Histologically, an enormous eosinophilia is seen in the walls of the medium bronchi, in the allergic group, similar to that which occurs in human asthma at the junction of the bronchial and lung tissues. In the drug group a different picture of chronic bronchitis is seen. It is concluded that the complete picture of bronchial asthma is obtained by an antigen–antibody reaction in the bronchi and is not truly imitated by the drug reactions. C. A. A.

Microscopic observations of bronchiolar reactions. T. SOLLMANN and A. J. GILBERT (J. Pharm. Exp. Ther., 1937, **61**, 272—285).—Bronchiolar contractions are increased greatly by acetyl-β-methylcholine chloride, pilocarpine, eserine, and histamine and less powerfully by $Ba^{\cdot\cdot}$, nicotine, CN', and benzedrine. Atropine, adrenaline, papaverine, and, to a slight extent, ephedrine cause dilation of the bronchioles, and in most cases counteract the effect of the substances which cause contraction. Rabbit's bronchioles sensitised to ovalbumin respond normally to both groups of substances but undergo anaphylactic spastic contraction when ovalbumin is added. The movements of bronchiolar cilia are restricted by relatively high concns. of cyanide, chloroform, ether, or nicotine but not affected by the other substances which also do not affect the alveoli and infundibuli. W. McC.

Pulmonary œdema following bilateral cervical vagotomy in rabbit. S. FARBER (J. Exp. Med., 1937, **66**, 397—404).—Bilateral cervical vagotomy in rabbits usually causes death within 24 hr. from pulmonary œdema. This still occurs when free air-entry is allowed through a tracheotomy tube, thus excluding laryngeal paralysis, aspiration of foreign material, infection, and slow asphyxia as essential factors in the production of the œdema. It is suggested that the œdema is of neuropathic origin. A. C. F.

Pathogenesis of neuropathic pulmonary œdema. S. FARBER (J. Exp. Med., 1937, **66**, 405—412).—Using guinea-pigs, neuropathic pulmonary œdema is produced by double cervical vagotomy even when artificial respiration is carried on throughout the experiment. Direct observation shows that the heart continues to beat strongly up to the time of death. Application of novocaine to the lungs produces changes similar to those seen after vagotomy. It is concluded that the essential factor in the production of pulmonary œdema after vagotomy is interference with the normal vasomotor control to the lungs. A. C. F.

Reduction of oxyhæmoglobin in tissues and relation to condition of organism. A. NEUMANN and K. OPPERMANN (Arbeitsphysiol., 1937, **9**, 546—549).—The time for the reduction of oxyhæmoglobin to hæmoglobin in the finger with occluded circulation was measured spectroscopically in 200 workers in chemical factories. The time was reduced in workers in hot surroundings. Workers in CS_2 and cyanogen showed the same vals. during work as other workers at rest. It is deduced that workers in CS_2 and cyanogen suffer from an interference with cellular respiration. E. J. W.

Relation between respiratory quotient and alveolar CO_2 tension. O. FITZGERALD and J. M. O'CONNOR (J. Physiol., 1937, **91**, 59—65).—The partial pressure of CO_2 in the alveolar air of the two individuals tested rises with rising R.Q. The change in alveolar CO_2 tension corresponds with a fall in p_H of 0·04 over the range of R.Q. 0·72—0·97. When observations in which a marked sp. dynamic effect from protein might be expected are omitted, the energy consumption with changing R.Q. approaches uniformity; statistical analysis shows that here the

CO_2 tension rises with rising CO_2 production and that the O_2 consumption falls with rising CO_2 tension. The probable extent of the influence of CO_2 tension on O_2 consumption is quantitatively comparable with the influence of p_H on O_2 consumption in the rabbit. The relation of these observations to the isodynamic law is discussed. A. C.

Variations in alveolar gaseous tensions and in the gaseous contents and p_H of arterial blood of resting men. R. Shoji, H. Yoshimura, K. Saito, and T. Fujimoto (J. Biochem. Japan, 1937, **25**, 453—459).—Data for the CO_2 and O_2 tensions of alveolar air and, with p_H, of arterial blood, frequency and depth of respiration, ventilation, and gaseous exchange are tabulated. No correlation could be established. Haldane's principle of alveolar or arterial CO_2 controlling ventilation does not apply to resting men. F. O. H.

Influence of alcohol on resistance to anoxæmia. J. M. Munoz (Compt. rend. Soc. Biol., 1937, **126**, 625—626).—Alcohol in doses of 2—4 c.c. per kg. diminishes resistance to anoxia in rats. D. T. B.

Distribution of carbonic anhydrase in certain marine invertebrates. J. K. W. Ferguson, L. Lewis, and J. Smith (J. Cell. Comp. Physiol., 1937, **10**, 395—400).—Different tissues of the squid, king crab, spider crab, and lobster were finely divided by freezing and crushing, and extracted with distilled water. The amounts of enzyme present in the extracts were determined by the method of Meldrum and Roughton. The greatest amount was present in the gills, much less in muscle, and little or none in blood. V. J. W.

Influence of gymnastic exercises on gaseous metabolism. W. Missiuro and A. Perlberg (Arbeitsphysiol., 1937, **9**, 514—527).—The min. vol. of air, O_2 consumption, and R.Q. were measured before, during, and after 45 min. of Swedish exercises. The O_2 usage showed three peaks, and reached its highest point during running exercises. The energy requirements were 191—194 cal. The O_2 debt is mainly settled during the time the exercises are being carried out; about $\frac{1}{16}$ is settled subsequently. Fifteen min. rest is sufficient for the gaseous metabolism to return to normal. Exercise should be arranged so that the max. intensity falls about the middle of the period of exercise. E. J. W.

Influence of the cerebral cortex on gaseous metabolism. R. P. Olnjanskaja (Arbeitsphysiol., 1937, **9**, 528—545).—By associating an indifferent stimulus (metronome) with muscular work, it was eventually possible to obtain changes in gaseous metabolism in response to the metronome alone. A worker at rest who was surrounded by others who were doing heavy factory work showed an increase in gaseous metabolism. It is concluded that there is a system of conditioned reflexes which can influence metabolism through subcortical mechanisms. These must be taken into account in all investigations on gaseous metabolism. E. J. W.

Effect of Formosan snake-venoms on the respiration of dogs. I. Variations in respiration due to single doses of different snake-venoms in the absence of therapeutic agents. II. Effect of therapeutic agents on the variation in respiration caused by the venom of *Trimeresurus mucrosquamatus*. K. Rai (Folia Pharmacol. Japon., 1937, **24**, 123—138, 139—184).—I. In general, respiration in dogs is stimulated by small doses of snake-venom and paralysed by larger doses. The effect is more marked when the injection is intravenous rather than subcutaneous.

II. The therapeutic action of various substances on the respiration of dogs injected with snake-venom is described. E. M. W.

Skeletal musculature and vegetative nervous system. H. Mies (Klin. Woch., 1937, **16**, 593—595).—A review. W. J. L.

Double refraction in muscle rigor. T. Y. Liang (Chinese J. Physiol., 1937, **12**, 167—176).—Frog's gastrocnemius was sent into isometric rigor by chloroform, caffeine, quinine, acetylcholine, iodoacetic acid, heat, or death, or by the other agents preceded by iodoacetic acid. The double refraction always decreased; this was not related to lactic acid production but to tension, and was attributed to alteration in the structure of the myosin micelles of the fibrils. N. H.

Behaviour of cross-striation and muscle spectrum during compression contraction. U. Ebbecke (Pflüger's Archiv, 1937, **238**, 749—752).—Compression contraction causes a decrease and disappearance of the cross-striations; the longitudinal striations become more distinct. The spectrum of Ranvier disappears, but this is reversible if the contraction is not too prolonged. J. M. R.

Tension during the compression contraction. U. Ebbecke and O. Hasenbring (Pflüger's Archiv, 1937, **238**, 753—757).—The degree of tension produced by compression is similar to that attained during a tetanus produced by electrical excitation. The muscle is, however, rapidly damaged. J. M. R.

Methods of analysing the heat production of muscle. A. V. Hill (Proc. Roy. Soc., 1937, **B**, **124**, 114—136).—Disadvantages of previous methods of analysing the time-course of the initial heat production of muscle are discussed, and a new method is described, which does not require that a muscle should be of uniform cross-section. A very thin thermopile is used (45—60 μ.) of such a small heat capacity that the delay in taking up the temp. of the muscle can be neglected. The e.m.f. of the thermopile, and thus the temp. of the muscle, is determined by simple analysis of the galvanometer record. No "heating control" is necessary except for the delayed heat. Use of the thin thermopile avoids the necessity of "calibration" with a known amount of electrical energy; deflexions can be transformed directly into abs. units from the consts. of the apparatus. An error which has hitherto affected all experiments on heat production of muscles allowed to shorten is discussed. The part of the muscle off the thermopile is less effectively cooled than the part on it, because heat is lost in the latter case by conduction in the wires. The error arises when the warmer part comes on to the thermopile in contraction,

and may be very large; it can be entirely avoided by using a "protected" thermopile, *i.e.*, one with a "dummy" extension of identical thermal conductivity. A moving-coil galvanometer of short period sufficiently sensitive for most myothermic experiments is described. F. B. P.

Oxygen consumption and respiratory quotient of caffeinised frog muscles. G. SASLOW (J. Cell. Comp. Physiol., 1937, **10**, 385—394).—Frog muscles immersed in Ringer's solution containing 0·03—0·042% of caffeine consume at 23° 4—24 times as much O_2 as controls. Their R.Q. was 1 and in the absence of O_2 they formed lactic acid at a rate of 80—90 mg. % per hr. The effect of the caffeine was much lessened by the addition of iodoacetate. V. J. W.

Relation between mechanical and electrical activity of a molluscan unstriated muscle. C. M. FLETCHER (J. Physiol., 1937, **91**, 172—185).—In the anterior retractor of the byssus of *Mytilus edulis* the action potential is followed by contraction of the muscle. The size of the action potential, and the contraction, normally vary in a parallel way. Application of $Mg^{\cdot\cdot}$ to the muscle abolishes the action potential. No contraction can be obtained in response to stimulation by brief currents, but when a prolonged galvanic current is applied to the muscle it will contract in the absence of conducted action potentials, the contraction being localised to the cathode. The contraction in response to a tetanic stimulus, with its associated action potentials, is distributed over the whole muscle. In the phasic contraction of unstriated muscles the action potential plays the same essential part as in the contraction of striated muscle; toxic contractions may occur in the absence of conducted action potentials. A. C.

Experimental demonstration of the compensatory pause in skeletal muscle. H. JÖLLENBECK (Z. Biol., 1937, **98**, 347—351).—A maximal const. current is applied to the pelvic end of the sartorius of a curarised frog, and rhythmic impulses are led off from the tibial end; when extra stimuli (maximal induction shocks) are applied to the intermediate portion of the muscle, the repetitive response of the muscle shows, as expected, a compensatory pause. B. K.

Influence of adrenaline, choline, acetylcholine, and pilocarpine on the muscle period. H. THEISSEN (Z. Biol., 1937, **98**, 378—385).—The curarised sartorius of *Rana esculenta* was stimulated with a const. current pulse, its repetitive response recorded, and the interval between the impulses measured. After the application of adrenaline, choline, acetylcholine, and pilocarpine a shortening of this interval, up to 20%, was found. B. K.

Local state of excitation in mucles. V. S. RUSSINOV (Trans. Physiol. Inst. Leningrad, 1936, **17**, 16).—When a skeletal muscle is stimulated by a continuous current, the main change consists in the development of a steady local state of excitation under the cathode. Relaxation following the contracture is due to the action of the anode on some section of the muscular tissue. J. WA.

Osmotic pressure of muscles in veratrine and nicotine contraction. F. GENTILE (Arch. ital. Biol., 1935, **93**, 190—196; Chem. Zentr., 1936, i, 4178).—Frog gastrocnemius pretreated with veratrine or nicotine and suspended in water showed a smaller gain in wt. than did untreated muscle. The difference is related to changes in osmotic properties of the muscle membrane. A. G. P.

Initial stages of glycolysis in muscle extracts. L. P. KENDAL and L. H. STICKLAND (Nature, 1937, **140**, 360—361).—Using the purified extracts of the glycolytic enzyme system previously described (A., 1937, III, 469), no esterification of H_3PO_4 occurs when $Mg^{\cdot\cdot}$ alone is added as co-enzyme. When adenosine triphosphate is also present rapid esterification occurs. The ester first formed consists wholly of an easily-hydrolysable ester with the properties of hexose 1-monophosphoric acid (A., 1936, 1533), but in the later stages of incubation, the total amount of esterification increases more slowly, and this ester is gradually converted into hexose 6-monophosphate. The amount of adenosine triphosphate required is $\ll$ that necessary for glycolysis as a whole to take place with optimal speed, and the amount of easily hydrolysed ester formed is in excess of that which could be formed by simple transference of PO_4 from the added adenosine triphosphate to the starch. No lactic or pyruvic acid is formed, and adenylic acid itself brings about no esterification. The conversion of the easily hydrolysed ester into hexose monophosphate is much accelerated by the addition of a trace of hexose diphosphate. L. S. T.

Mechanism of lactic acid production in muscle. I. BANGA (Z. physiol. Chem., 1937, **249**, 209—210).—The clear liquid from extract of pigeon's breast muscle in presence of hexose diphosphate produces almost as much lactic acid as does the original extract. Hence interaction of pyruvic acid and triose phosphate is not indispensible for biological lactic acid production; when the sediment is added, pyruvic acid is activated and such interaction leads, as in muscle, to lactic acid production. Lactic dehydrogenase affects not the rate of lactic acid production but the route by which triose phosphate is converted into lactic acid. W. McC.

Rôle of the yellow enzyme in respiration. I. BANGA (Z. physiol. Chem., 1937, **249**, 205—208).—In the transfer of H by the dehydrogenase systems of pigeon's breast muscle, the yellow enzyme acts as intermediate carrier between malic and succinic dehydrogenases, stimulating the oxidation of malic acid. Inhibition by the oxalacetic acid produced is prevented by addition of glutamic acid or of hexose diphosphate and activator. The yellow enzyme increases the O_2 uptake of the systems only if sufficient dicarboxylic acid is present. W. McC.

Activator and donator in respiration of pigeon breast muscle. I. BANGA (Z. physiol. Chem., 1937, **249**, 183—188).—The turbid aq. extract of the muscle yields a clear liquid (containing co-enzymes, hexose mono- and di-phosphate, and a respiratory activator) and a granular sediment (containing cytochrome, cytochrome oxidase, and the dehydrogenases of succinic, malic, lactic, and citric acid). The O_2

consumption of the liquid and sediment separately is low but that of the mixture high. The activator, which is necessary for respiration but is not identical with the yellow enzyme, is separated by pptn. with acetone or with 90% alcohol followed by acetone at —20°, is non-dialysable and unstable (activity lost in 2 days at —20°), is very readily destroyed by acid, alkali, and heat (65°), and is adsorbed by fuller's earth and Lloyd's reagent. It activates triose derived from hexose mono- and di-phosphate so that oxalacetic acid is reduced by H from triose. Reduction of oxalacetic or pyruvic acid by the sediment in presence of hexose mono- or di-phosphate or triose derived from them occurs only if the activator is also present. Possibly the activator is triose phosphate dehydrogenase. W. McC.

Oxygen consumption and recovery heat production in muscles treated with bromo- and iodo-acetate. G. SASLOW (J. Cell. Comp. Physiol., 1936, **8**, 479—491).—Treatment with bromo- or iodo-acetate completely inhibits lactic acid formation in resting muscles after 45 min., although resting O_2 consumption is still about 70% of normal with bromo- and about 90% of normal with iodo-acetate. There is a slow, progressive decrease in O_2 consumption, which is more marked with bromo- than with iodo-acetate. Recovery heat production of the poisoned muscles remains normal until the resting O_2 consumption falls below 40—50% of normal. Iodoacetate is about 6 times as effective as bromoacetate in inhibiting formation of lactic acid. M. A. B.

Native and denatured muscle-proteins. E. C. B. SMITH (Proc. Roy. Soc., 1937, **B**, **124**, 136—150).—Difficulty of clean separation of muscle-protein fractions is due to the readiness with which certain of them undergo denaturation. The separate existence of globulin *X* (Meyer and Weber) is confirmed. A fourth native protein (myoalbumin) has been isolated in a denatured form. The four sol. proteins are differentiated by (1) isoelectric point, (2) solubility in H_2O and aq. salt solutions, and (3) behaviour when rapidly acidified with dil. mineral acid and neutralised. Myoalbumin slowly denatures at all vals. of p_H between 2 and 7, and the product is insol. in dil. acid (distinction from myogen). Myosin in complete absence of salt is not affected by dil. acid; it even regains the property of double refraction of flow when neutralised and redissolved in a salt solution. The author considers that myosin as ordinarily prepared consists of a single native protein species; myogen cannot be separated from myoalbumin in the native state, but the denatured proteins can be fairly readily separated; globulin *X* is the most difficult individual fraction to prepare because of the tendency of denatured proteins to disperse in its solutions. F. B. P.

Fractionation and absorption spectra of lobster proteins. I. K. KONDO, T. YAMADA, and S. SHINANO. **II.** K. KONDO and T. YAMADA (J. Agric. Chem. Soc. Japan, 1937, **13**, 1129—1137, 1138—1145).—I. Four kinds of proteins, water-sol., saline-sol., dil. alkali-sol., and dil. alkali-insol., called respectively myogen, myosin, myotelin, and myosein are isolated from fresh female lobster meat (*Penaeus canaliculatus*, Oliv.). The first two were separated into three impure fractions by fractional pptn. with $(NH_4)_2SO_4$. The absorptive powers of the fractions from myogen, but not from myosin, varied with ability to be pptd. by $(NH_4)_2SO_4$. The absorptive powers, and contents of tyrosine and tryptophan were in the order myogen > myotelin > myosin. The content of arginine was in the order myogen > myosin > myotelin, whilst the reverse held for histidine, lysine, and cystine.

II. Absorption spectra of the fractions of the protein sol. in hot water showed that two kinds of protein were present. One contains no tyrosine or tryptophan whilst the other ("myomin") contains a certain amount. J. N. A.

Diffusible and non-diffusible potassium of muscle. A. REGINSTER (Arch. int. Physiol., 1937, **45**, 69—74).—The results of Ernst and Fricker are confirmed. The ratio of combined K to ionised K varies between 2 and 4 in resting frog muscle, but falls to 1·4—1·8 after prolonged activity, the ionised K being increased at the expense of the combined K. C.E.B.

Liberation of potassium by muscles subjected to electrotonus or stimulation. V. BUREAU (Arch. int. Physiol., 1937, **45**, 40—68).—A method is described for determining the K gained or lost at the anodic and cathodic regions of frog muscle immersed in Ringer's solution, and traversed by a const. current. A muscle resting in Ringer's solution served as a control. Besides diffusible K, K is liberated at the cathode ("true cathodic effect"). Transport of K to the interior of muscles is possible only if the permeability of the polarised membranes is greatly increased, *e.g.*, by electro-coagulation. If this is done, a still further amount of K can be liberated at the cathode. Muscular contraction, whether direct or indirect, is accompanied by a further liberation of K. If the excitation is direct, this K sums with the true cathode liberation. These liberations of K are all due to ionisation of non-diffusible org. K complexes. Muscular excitability appears to be partly conditioned by the ratio of intrafibrillary K to extrafibrillary K. C. E. B.

Action of potassium chloride on mammalian muscle. G. L. BROWN (J. Physiol., 1937, **91**, 4—5P).—KCl in concns. between 5 and 100 mg. per c.c. injected (close arterial method) in vols. of 0·5 c.c. into normal gastrocnemius (cat) and 0·25 c.c. into tibialis anticus causes an immediate, twitch-like contraction, closely resembling that evoked by acetylcholine in 1000 times smaller concns. Electrical examination of the muscle shows that the K contraction is accompanied by a brief outburst of asynchronous, diphasic action potentials, closely resembling those produced by acetylcholine. The potentiating action of KCl appears to involve the general reaction of the muscle fibre itself, and not the neuromuscular transmission exclusively. A. C.

Neuromuscular junction. VII. Eserine-like effects of barium on motor nerve-endings. T. P. FENG (Chinese J. Physiol., 1937, **12**, 177—196).—When toad sartorius is soaked in Ringer's solution containing 50—240 mg. of $BaCl_2$ per 100 c.c., the

twitch on stimulation of the nerve-free end is slightly above normal and may show a slight contracture. If the innervated end is soaked in the Ba solution, the muscle twitches spontaneously, the response to a single stimulus to the nerve is a tetanus, and repeated indirect stimulation at high frequencies or for long periods produces Wedensky inhibition followed by contracture. The effects are most pronounced at 22°. Prolonged soaking produces complete neuromuscular block. Soaking the nerve in Ba solution sometimes makes it discharge repetitively to a single stimulus, and repeated stimuli depress subsequent twitches. Ba sensitises the muscle to acetylcholine. Ca suppresses the spontaneous twitches, the contracture, and the repetitive response to a single stimulus brought about by the action of Ba on the muscle or the nerve. Curare antagonises the Ba contracture, but does not prevent the repetitive response, so long as the block is incomplete. It is suggested that Ba makes the nerve-endings unstable so that they discharge acetylcholine spontaneously. N. H.

Reaction of the amphibian skeletal muscle to calcium ion and the ionisation of calcium citrate. I. CHAO (Chinese J. Physiol., 1937, **12**, 101—108).—Toad sartorius was stimulated once per min. by submaximal condenser shocks at its nerve-free end, during immersion in Ringer's solutions in which NaCl had been replaced by various proportions of $CaCl_2$ and Na_3C (C = citrate ion), until the contraction matched that in a solution containing 1 mM. $CaCl_2$. Assuming that solutions containing equal concns. of Ca^{++} produce equal contractions, the const. for the dissociation of Ca_3C_2 to Ca^{++} and CaC^- was calc. to be 0·00060. Using this const., solutions containing equal concns. of Ca^{++} but different concns. of total Ca and citrate were prepared and found to have equal effects on the contraction. If the total Ca was kept const. and the citrate decreased the contraction progressively increased; if the total citrate was kept const. and the total Ca increased, the contraction progressively decreased. The prep. was sensitive up to 5 mM. Ca. N. H.

Neuromuscular junction. VI. Potentiation by eserine of response to single indirect stimulus in amphibian nerve-muscle preparations. T. P. FENG (Chinese J. Physiol., 1937, **12**, 51—58).—The isolated sciatic-sartorius prep. of the toad was stimulated either through its nerve or at the nerve-free end by single condenser discharges at intervals of 1—2 min. After 2 min. exposure to 1 : 3000 eserine, the response to indirect stimuli was increased. Excess of Ca reduced the potentiation; rise of temp. augmented it; it did not occur if the stimuli were less than ½ min. apart. Prostigmine acted similarly to eserine. N. H.

Action of eserine on muscle of worms and molluscs. L. M. BACQ and G. COPPEÉ (Compt. rend. Soc. Biol., 1937, **125**, 1059—1500).—Eserine potentiates the effect of nerve stimulation on the muscle of worms, but not of molluscs. A cholinergic transmission mechanism probably occurs in the former, but not in the latter. D. T. B.

Action of menisine and menisidine on amphibian skeletal muscles. T. Q. CHOU, T. W. LU, and G. H. WANG (Chinese J. Physiol., 1937, **12**, 163—166).—Both alkaloids abolished the response of toad sartorius to indirect and then to direct stimulation. When painted on the nerve they had no effect. N. H.

Physiological evidence for the syncytial character of smooth muscle. E. BOZLER (Science, 1937, **86**, 476).—Thin strips of longitudinal muscle of the uterus of the cat and guinea-pig were stimulated electrically. Excitation at right-angles to the muscle fibres required a threshold current 20 times that for longitudinal stimulation. This would not occur if the muscle fibres were excited by a nerve plexus. On closing a current, the response starts at the cathode, and electrotonus occurs, showing that the whole muscle acts as a unit. Similar results were obtained with ureter and intestinal strips. It is concluded that smooth muscle acts as a syncytium. C. A. K.

Post-contraction of muscles of the arm. F. ALLEN (Quart. J. Exp. Physiol., 1937, **26**, 305—317).—Experiments on the post-contraction of the muscles of the arm following isometric contraction showed that, both ipse- and contra-laterally, repetition of the stimulus after a short period produced a diminished response, whilst a longer interval gave an augmented one. Diminished ipselateral responses occurred when the leg was stimulated for a short time immediately before stimulation of the arm. The post-contraction is oscillatory in character, and the fact that relatively diminished and augmented responses follow each other after a lapse of certain intervals of time indicates that processes of inhibition and facilitation succeed each other until neural equilibrium is obtained. Control of the reflexes by the higher centres associated with consciousness is shown by a transitory arrest of the response by conscious inhibition. T. S. G. J.

Endurance during static work. J. A. SHEYDIN (Trans. Physiol. Inst. Leningrad, 1936, **16**, 141).—Fatigue in static work depends on the intensity of the effort; during slight or moderate efforts of long duration, causing a subsequent decrease of the efficiency of an organ, the rôle of the circulation and metabolic processes is important. During efforts which cannot be maintained for more than 75 sec., the cessation of work is due to inhibition centrally generated. J. WA.

Ergometrographic observations on efficiency of work in right- and left-handed persons. S. BORDÁS (Arbeitsphysiol., 1937, **9**, 550—561).—The efficiency of the right hand in left-handed individuals is greater than that of the left hand in right-handed individuals. E. J. W.

Discussion on transmission of excitation in living material (Proc. Roy. Soc., 1937, **B**, **123**, 397—421).—The following spoke: C. F. A. Pantin, "Junctional transmission of stimuli in the lower animals"; followed by A. von Muralt, "Chemical wave transmission in excited nerve"; A. L. Hodgkin, "Evidence for electrical transmission of the nervous impulse"; F. Buchthal, "Potential differences in the single end-plate-muscle fibre system, their relation to irritability and their changes under excitation"; G. L. Brown, "Neuromuscular and ganglionic trans-

mission by acetylcholine"; A. M. Monnier, "Present state of the electrical theory of transmission"; J. C. Eccles, "The responses which nerve impulses evoke in nerve and muscle cells"; W. A. H. Rushton, "Factors involved in initiation of the nervous impulse"; B. H. C. Matthews, "Do the rhythmic discharges of sense organs and of motor neurones originate in the same way?"; Z. M. Bacq, "Cholinergic nerves in invertebrates." F. B. P.

Graphical solution of a differential equation with application to Hill's treatment of nerve excitation. W. A. H. Rushton (Proc. Roy. Soc., 1937, **B**, **123**, 382—395).—A rapid simple graphical analysis of the equation $a(dy/dt) + y = f(t)$ is described; it is easily performed by those unfamiliar with integration. The val. and uses of the method are dealt with. It is applied to the solution of Hill's treatment of nerve excitation, and a description is given of a simple routine operation which will give the curve relating current strength with duration of flow for any form of stimulating current. The application is illustrated by the case of a condenser discharge and of linearly increasing currents. A discussion deals with the physical significance of V and U. F. B. P.

Initiation of the propagated disturbance. W. A. H. Rushton (Proc. Roy. Soc., 1937, **B**, **124**, 210—243).—It is assumed that a certain depolarisation of a nerve at a point is the necessary and sufficient condition that an action potential be generated at that point, and that propagation results from the stimulation of the inactive region in front of the propagated wave by the spread of the action current. It follows that excitation is inadequate unless it activates a sufficient length of nerve to give an action current large enough to propagate. The problem is first worked out on an over-simplified scheme, and the theory is then applied to a selection of the known observations on excitability. The strength–duration curve, the voltage–capacity curve, and the effect of two successive shocks are satisfactorily described by the scheme, including certain aspects which will not fit the classical theories. The spatial relations of excitation are also satisfactorily described, including an explanation of the non-propagated contraction which arises from micro-stimulation of single muscle fibres. Errors of assumption made in the present theory for the sake of simplicity are discussed; future developments of the theory are suggested, and suggestions for further investigations are made. F. B. P.

Experimental evidence for a non-conducted response of nerve to subthreshold stimulation. B. Katz (Proc. Roy. Soc., 1937, **B**, **124**, 244—276).—If conduction of an impulse is dependent on excitation of each resting part by activity in its adjacent region, initially a certain minimal length of nerve must be excited in order to give rise to a propagated disturbance. Therefore a subthreshold stimulus, by exciting too small a region, might produce a transitory localised response, the spread and size of which are insufficient to excite resting points further on. Experimental evidence is produced for the existence of this non-conducted response; its presence, relative size, and time relations are traced by excitability measurements with short double shocks. When the conditioning shocks are cathodic and weak, or anodic and of any strength, decay of the "excitatory disturbance" follows a simple, approx. exponential relation. With a conditioning shock of strength approaching threshold, the time course of the local "excitatory disturbance" shows a "hump," superimposed on the exponential decay. This is attributed to the local response of a small region of nerve. When superthreshold stimuli are applied, it is possible, using suppressing, anodic test shocks, to trace the initial growth of the new-born impulse, and its transition from local to propagating strength. Various phenomena inconsistent with the classical theories are observed with high-frequency a.c. stimulation (summation, accommodation, electrotonic excitability changes). The phenomena are shown to be attributable to local action currents, elicited by the cathodic half-cycles of the applied stimulus. Using a sensitive galvanometer and subthreshold alternating stimuli, a local negative electromotive charge is found which has the properties of a non-conducted response. F. B. P.

Local electric response in crustacean nerve. A. L. Hodgkin (J. Physiol., 1937, **91**, 5—7P).—The electrical changes produced by brief induction shocks were examined in crustacean nerve (single fibre from limb nerves of *Carcinus maenas*). The response to a threshold shock alternates between a small monophasic wave and a large disphasic action potential; the shape of the monophasic wave suggests that it is a local response of the stimulated region. This conclusion is strengthened by the fact that it is abolished in the abs. refractory period. A. C.

Nerve stimulation by rapid variations in current. A. Chweitzer (Ann. Physiol. Physiochim. biol., 1937, **13**, 397—448).—Nerves were stimulated by changes of intensity of current, with and without complete break. The effects of changes of direction and of intensity were plotted, with initial current (I_0) on abscissæ and minimal exciting current (ΔI) on ordinates (curves of thresholds). The influence of cocaine, KCl, and $CaCl_2$ on these curves is discussed. The form of these curves is said to explain the lacuna of Grützner (disappearance of break excitation with certain intensities), and the occurrence of three different categories of break threshold. D. T. B.

Temperature parabiosis of nerve in connexion with colorimetric changes in the parabiotic region. E. K. Shukov (Trans. Physiol. Inst. Leningrad, 1936, **17**, 126—128).—Vital staining with neutral-red was used as indicator in a specially constructed apparatus, making the taking of myograph records possible. Thermal parabiosis and cold (in 50% of cases) caused an acidification locally; this did not disappear on the return of conductivity, but spread along the fibre. In most cases with warming the nerve became more alkaline before it became acid and the distant parts remained alkaline. C. A. A.

Potential changes in crab's nerve. A. Arvamtaki (Compt. rend. Soc. Biol., 1937, **125**, 1000—1003).—A nervous impulse reaching a point in anelectrotonus sets up a retarded action potential,

and from this point a discharge of a series of negative waves occurs. D. T. B.

Iterative nervous mechanisms. A. B. CHAUCHARD and P. CHAUCHARD (Arch. int. Pharmacodyn., 1937, **57**, 141—180).—The chronaxies of the sympathetic and parasympathetic nerve supply of the submaxillary gland are increased threefold by division of their central connexions. D. T. B.

Action of iodoacetic acid and lactates on nerve. E. K. SHUKOV (Trans. Physiol. Inst. Leningrad, 1936, **17**, 124—125).—Frog's nerve, after its conductivity has been abolished by $CH_2I{\cdot}CO_2H$, does not recover for several hr. Poisoning develops before loss of activity, for if the nerve is placed in Ringer's solution at the first sign of decreased conductivity, the progressive development of non-conductivity is not prevented. Na lactate restores excitability and conductivity in poisoned nerve, but only if O_2 is present. J. WA.

Effects of tetraethylammonium iodide on the electrical response and the accommodation of nerve. S. L. COWAN and W. G. WALTER (J. Physiol., 1937, **91**, 101—126).—Treatment of frog nerve (sciatic) with Ringer's solution containing tetraethylammonium iodide (10 mM.) produces a prolongation of the negative after-potential and a repetitive discharge in response to a single shock. Tetraethylammonium iodide (15 mM. and more) causes "spontaneous" asynchronous activity in nerve. Repetitive response in nerve is due to an increase in the time const. of "accommodation" (λ) of the tissue (Hill's theory). This time const. increases with increase in the concn. of the iodide applied to the nerve. The iodide in Ringer solution reduces the rheobase considerably below its normal val. "Spontaneous" activity due to ions of the iodide is the limiting result of these two effects; these effects can be prevented or reversed by adequate concn. of $Ca^{\cdot\cdot}$ The iodide ions reduce the threshold for excitation at break of const. current to a greater extent than the threshold for excitation at make. A. C.

Disturbances in spread of excitation in Medusæ. A. BETHE (Z. vergl. Physiol., 1937, **24**, 613—637).—In the subumbrella of some Medusæ (*e.g.*, *Cyanea*) separate muscle bundles are connected by a nerve net which transmits excitation from one muscle to another. By reducing the conducting nervous tissue to a narrow bridge, various disturbances in the spread of activity, similar to those observed in the vertebrate heart, are produced. Total block, as the immediate result of the operation, is followed by a gradual recovery of conduction, which at first involves a long latency and often succeeds in one direction only (transmission in the opposite direction can be facilitated by repetitive stimuli). With rhythmic stimulation of increasing frequency, the response at first follows the rate of stimulation, and then shows a regular dropping out of an increasing no. of impulses. Size and rhythm of the impulses, at the higher frequencies, appear to depend on the strength of the stimulus. B. K.

Effects of cooling spinal cord in the frog. M. OZORIO (Compt. rend. Soc. Biol., 1937, **126**, 196—198).—Rapid cooling of the spinal cord of the South American frog produces convulsions and loss of reflexes; in the European frog reflexes are retained and no convulsions occur. D. T. B.

Effect of electric stimulation on heat production in isolated spinal cord of cold-blooded animals. H. J. TRURNIT (Z. Biol., 1937, **98**, 352—369).—The heat production of the isolated spinal cord of frogs was measured with thermopile and galvanometer and analysed by Holzlöhner and Trurnit's method. Rhythmic electric shocks of various frequencies and stimulation periods were applied, either directly or indirectly (*e.g.*, through the sciatic nerve). The influence of temp. changes was studied. The total heat production increased with the duration and frequency of stimulation and with temp. The frequency/heat relation of the spinal cord was greatly influenced by the stimulation period, whilst temp. changes had an effect much less than in peripheral nerve. The rate of rise of the heat production, immediate after-effects of stimulation, probably due to after-discharges, and the relative size of the recovery heat were analysed under various conditions. B. K.

Heat-production curve during excitation of isolated spinal cord of frogs. H. J. TRURNIT (Z. Biol., 1937, **98**, 370—377).—A scheme is proposed describing the heat curve of the indirectly stimulated spinal cord of frogs as composed of elements of "initial" and "recovery" heat following each single stimulus. The recovery heat, during repetitive stimulation, is supposed to build up similarly to that in peripheral nerve, whilst the initial heat is assumed to depend largely on the after-discharges caused by each stimulus (as indicated by the delayed fall of the maximal heat production after the stimulus has ceased). The much larger initial heat of the cord, as compared with peripheral nerve, is suggested to be due to the multiple after-discharges, and not to a greater production of heat by each single impulse. B. K.

Prolonged after-effect from electrical stimulation of the cerebellar cortex in unanæsthetised cats. S. L. CLARK (Science, 1937, **86**, 377—379).—Various regions of the cerebellar cortex were stimulated by means of a concentric electrode previously introduced through a trephine hole in the skull of a cat, using 2—5 v., 60 cycle a.c., for 2—10 sec. Stimulation of one lobe produced movements which involved first the head, during the stimulus, and subsequently spread to the limbs, trunk, and tail, the forelimbs being affected before the hind limbs and the homolateral before the contralateral limbs. The movements resembled those seen in "slow motion" pictures and lasted 5—10 min. Removal of the contralateral motor area of the cerebral cortex did not abolish the above effects. C. A. K.

Cerebellum. O. LARSELL (Arch. Neurol. Psychiat., Chicago, 1937, **38**, 580—607).—A summary of the anatomical and fibre relationships within the cerebellum, and of the efferent and afferent connexions with other parts of the nervous system. D. P. C. L.

Myelencephalic sympathetic centre. V. Comparative study of location of myelencephalic

pressor (sympathetic?) centre in vertebrates. R. K. S. LIM and Y. M. LU (Chinese J. Physiol., 1937, **12**, 197—222).—The medulla of the snake-fish, toad, turtle, hen, goat, pig, guinea-pig, rabbit, cat, hedgehog, and monkey was stimulated in different places while the arterial pressure was recorded. The pressor centre was bilateral and always near the vestibular nuclei, *i.e.*, at the caudal end of the 4th ventricle in mammals and at the cephalic end in the others.

N. H.

Relation of hypothalamus to disorders of personality. B. J. ALPERS (Arch. Neurol. Psychiat., Chicago, 1937, **38**, 291—303).—A case of dermoid of the 3rd ventricle with extensive destruction of the hypothalamus showed marked changes of mood and personality. These could not be referred to lesions in the cortex, nor to increased pressure.

D. P. C. L.

Hypothalamic regulation of temperature in monkey. S. W. RANSON, C. FISHER, and W. R. INGRAM (Arch. Neurol. Psychiat., Chicago, 1937, **38**, 445—466).—The temp. of the normal monkey varies considerably and is raised by struggling. Raised external temp. causes a rapid rise in rectal temp. to dangerous levels. Following electrolytic lesions in the hypothalamus, induced with the aid of the Horsley–Clarke instrument, one group of monkeys showed marked post-operative rises in temp., when kept at room temp., another group showed a more prolonged hypothermia together with an inability to accommodate to excessive external temp., whilst a third group showed no significant deviation from normal. Monkeys showing hyperthermia had lesions confined to the rostral portion of the hypothalamus. The hypothermic animals had lesions dorsal and lateral to the rostral end of the mamillary bodies. The inability of these animals to adjust to raised external temp. may be interpreted as due to interruption of descending tracts from the rostral region of the hypothalamus. D. P. C. L.

Liberation of adrenin and sympathin by stimulation of hypothalamus. H. W. MAGOUN, S. W. RANSON, and A. HETHERINGTON (Amer. J. Physiol., 1937, **119**, 615—622).—The hypothalamus was stimulated with the aid of the Horsley–Clarke instrument in cats under dial (0·6—0·7 mg. per kg.). As index of sympathin liberation the contractions of the nictitating membrane were recorded, sensitised by removal of superior cervical ganglion 15—20 days previously, and sometimes by the injection of cocaine (4—7 mg. per kg.); both adrenals were removed. To demonstrate adrenaline secretion the membrane was used denervated at the start of the experiment and cocaine was rarely used. The membrane so prepared responds after a longer latent period, and reaches its maximal tension more gradually after hypothalamic stimulation, than does normally innervated membrane. It is concluded that the initial effects of hypothalamic stimulation on the organs are due to direct nervous connexions, but that these effects are prolonged and intensified by liberation of adrenaline and sympathin. M. W. G.

Connexions between corpus striatum and substantia nigra in human brain. R. W. RUNDLES and J. W. PAPEZ (Arch. Neurol. Psychiat., Chicago, 1937, **38**, 550—563).—A case is described in which there was a bilateral degeneration of the caudate nucleus and putamen, with preservation of the globus pallidus, making it possible to study the efferent fibres from these nuclei independently. The striatum has direct fibre connexions with the globus pallidus and with the substantia nigra. The ansa lenticularis, fasciculus lenticularis, and the pallido-subthalamic tract contain no fibres of striate origin.

D. P. C. L.

Central nervous system and sugar metabolism. Clinical, pathological, and theoretical considerations with special reference to diabetes mellitus. A. R. VONDERAHE (Arch. Int. Med., 1937, **60**, 694—704).—A hypothesis is proposed to account for the relationship of the central nervous system to the occurrence of diabetes mellitus. The nucleus paraventricularis in the hypothalamus is assumed to be stimulated by the presence of sugar to activate the cells of the islets of Langerhans so that insulin is produced. This hypothesis is applied to diabetics without gross cerebral lesions and to hyperglycæmic patients having various brain lesions confirmed at autopsy. A. L.

Rôle of central nervous system and thyroid in heat regulation. B. VON ISSEKUTZ (Pflüger's Archiv, 1937, **238**, 787—801).—Following section of the cervical cord in dogs, heat production is inadequate when the animals are exposed to cold and the body temp. falls considerably, but after a few days only a small fall in body temp. occurs on exposure to low temp. After removal of the thyroid, normal body temp. can be maintained only when external heat is applied; administration of thyroxine temporarily improves temp. regulation. The animals become poikilothermic when the cervical cord and both vagi are cut and both inferior cervical ganglia and stellate ganglia are extirpated. J. M. R.

Histamine encephalopathy. M. SPIEGEL-ADOLF and E. SPIEGEL (Klin. Woch., 1937, **16**, 536—537).—Rabbits injected with 0·1—0·4 mg. of histamine per kg. daily for 14—32 days showed no clinical symptoms. They were then killed and the central nervous system, heart, and liver were examined histologically. Marked chromatolysis was present in the cerebellum, especially in the Purkinje cells. The changes were less marked in the cerebral cortex, brain stem, and spinal cord, and were proportional to the dosage used. There was swelling of the endothelial nuclei of the blood vessels, especially the capillaries. No degenerative changes were found in the heart. F. W. L.

Alternating-current narcosis in frogs. J. HOYOS (Z. Biol., 1937, **98**, 325—336).—The effect of low-frequency a.c. supplied by the mains (50 Hz, intensity 0·05—1 ma.) on the central excitability of normal frogs was studied. Rhythmic electric test stimuli were applied to the skin and changes in the size of the reflex movements during the application of the a.c. were recorded. With weak a.c. central excitability is always increased, previously subliminal test stimuli now becoming effective. Stronger a.c. cause general tetanic contractions. With low-frequency a.c. no evidence of a narcotic effect is

found; inhibitory after-effects, when present, are merely due to fatigue. B. K.

Hypertonic glucose solutions in cases of acute confusion and agitation. S. OLDBERG (Uppsala LäkFören. Förh., 1936, **42**, 257—262).—In 5 out of 6 cases investigated, intravenous injection of 20—30 ml. of 40% glucose solution had a quietening and sleep-producing effect, and in two cases a passing clarification of the consciousness. T. S. G. J.

Convulsions produced by cardiazol in certain mental patients. Y. K. FENG, Y. K. HUANG, and Y. K. HSÜ (Chinese J. Physiol., 1937, **12**, 239—248).—3 c.c. of 10% cardiazol was given intravenously to 49 patients and 16 controls. Convulsions, first clonic, then tonic, and then clonic, accompanied by loss of consciousness and accessory signs, *e.g.*, salivation, biting the tongue, cyanosis, occurred after 5—60 sec., and lasted ½—3½ min. 5 normals reacted, 6 out of 8 epileptics, and a few of other types, but no manic-depressives, schizoid psychopaths, or neurotics. N. H.

Effect on the electroencephalogram of certain drugs which influence nervous activity. F. A. GIBBS, E. L. GIBBS, and W. G. LENNOX (Arch. Int. Med., 1937, **60**, 154—166).—Observations on human beings were made of the effect on the electroencephalogram of 20 drugs known to affect the central nervous system. Only those drugs which were given in sufficiently large doses to cause impairment of consciousness or involuntary muscular movements produced marked alterations in the electroencephalogram. Drugs which caused a sleep-like state altered the electroencephalogram in the same way as natural sleep. Those causing a profound loss of consciousness produced records similar to those seen in stupor from whatever cause. Drugs causing convulsions resulted in alterations of electrical activity similar to those which occur in epilepsy. T. H. H.

Influence of the forebrain on autonomic reflex. R. S. MORISON and D. McK. RIOCH (Amer. J. Physiol., 1937, **120**, 257—277).—Cats were used usually under urethane anæsthesia and occasionally decerebrated by the anæmic method of Pollock and Davis. The sciatic nerves and occasionally the nerves from the liver were used as afferents for eliciting nictitating membrane reflexes. In 6 animals the neocortex was aseptically removed on one side and in 5 others on both sides. The variations in the responses of intact animals were found to be independent of the intensity, frequency, or duration of stimulation; the variations resulted from sudden and unexplained changes in the "excitability" or activity of the higher "centres" involved in the reflex. Stimulation of the cortex or of the basal ganglia inhibited or facilitated the reflex responses. In no instance was evidence obtained that the central inhibitory state destroyed central excitatory state permanently. Likewise stimulation of a cortical inhibitory area did not abolish the central excitatory state responsible for after-discharge, but only reduced the height of contraction during the maintenance of the stimulus. Three widely separated areas may contribute to the excitatory component of the reflex responses of the nictitating membrane; these were in the medulla, posterior hypothalamus, and cortex (mainly that portion lying on both margins and in the depths of the cruciate sulcus). At least two areas contributed inhibitory components, the cortical tissue surrounding the presylvian sulcus and extending laterally into the gyrus orbitalis, and an area at the level of the anterior hypothalamus. M. W. G.

Effects of removal of the prefrontal lobes in the monkey. R. MESSIMY and J. FINAN (Compt. rend. Soc. Biol., 1937, **126**, 201—203, 203—206).—The anterior portions of the frontal lobes were removed on both sides from monkeys (*Cereocebus torquatus*). Changes in character were observed. The tendon and postural reflexes were modified. D. T. B.

Functional activity and p_H of the cerebral cortex. J. G. D. DE BARENNE, W. S. McCULLOCH, and L. F. NIMS (J. Cell. Comp. Physiol., 1937, **10**, 272—289).—A glass electrode and a saline wick electrode were placed close together on the cortex of a curarised monkey under light dial anæsthesia and their p.d. and the respiration were recorded. It was found that hyperventilation or intravenous $NaHCO_3$ caused an "alkaline" shift of the cortex $[H^+]$ with increased electrical activity and excitability. Hypoventilation or intravenous HCl causes the reverse effects. V. J. W.

Deficiencies in the righting reflexes of cats following bilateral cortical lesions. R. W. BARRIS (Amer. J. Physiol., 1937, **120**, 225—231).—Observations were made on 11 cats in which the rostral portion of the neocortex was removed bilaterally. 24—48 hr. after operation, the labyrinthine righting reflexes were not fully developed, and the body on the body- and the body on the head-righting reflexes also appeared to be deficient. M. W. G.

Functional determinants of cerebral localisation. K. S. LASHLEY (Arch. Neurol. Psychiat., Chicago, 1937, **38**, 371—387).—A discussion. D. P. C. L.

Brain potentials during sleep. H. BLAKE and R. W. GERARD (Amer. J. Physiol., 1937, **119**, 692—703).—Brain potentials of young adults during normal night sleep, afternoon napping, post-insomnia sleep, and hypnosis were studied. Depth of sleep was determined by the duration of a fixed sound required to awaken the subject (response to a question) by records of movements and respiration, and an orthodox sleep-depth curve was obtained. Potential patterns correlate with sleep depth not only over long time changes but also over short time swings. Deep sleep was associated with a large regular potential wave at a frequency of ½—3 per sec.; lighter sleep with feeble irregular potentials or with a 10 per sec. rhythm. Results were interpreted in terms of excitation levels of cerebral neurones and of the play of nerve impulses on them. With low excitation a slow rhythm was manifest, with stronger excitation a faster one. M. W. G.

Independent control of alpha rhythm and psycho-galvanic response. T. W. FORBES and H. L. ANDREWS (Science, 1937, **86**, 474—476).—Simultaneous records of potentials were taken in human subjects from one skin and two head electrode pairs. Stimuli used were an electric shock, a 500-cycle

tone, a startling buzzer, and visual stimulation from opening and closing the eyes. Although there was often a simultaneous disturbance of both alpha waves and skin potential, there were also clear-cut examples of independence of these two effects; *e.g.*, with visual stimulation there was definite alpha block with no change in skin potential, and with an electric shock there was a change in skin potential, whilst the alpha rhythm was unaffected. C. A. K.

Changes in human brain potentials during the onset of sleep. H. DAVIS, P. A. DAVIS, A. L. LOOMIS, E. N. HARVEY, and G. HOBART (Science, 1937, **86**, 448—450).—Characteristic changes in the electroencephalogram occur during going to sleep. The alpha rhythm is first lost and low-voltage waves appear during the drowsy or "floating" state; subsequently delta waves appear, and real sleep is associated with moderate delta waves and short groups of waves with a frequency of 14 per sec. C. A. K.

Experimental lesions of cortex on psychogalvanic reflex in cat. H. G. SCHWARTZ (Arch. Neurol. Psychiat., Chicago., 1937, **38**, 308—320).—Skin resistance measurements were made on cats for 3—6 months after cortical lesions. Removal of the sensorimotor area, the cortex posterior to the sensorimotor area, or the cortex posterior to area 6 did not effect the normal change in skin resistance to various stimuli. After lesions of the area frontalis agranularis normal responses to stimuli were obtained on the same side. Pressure applied to both legs was effective, but there was no response to general stimuli on the contralateral side. A discrete incision between areas 4 and 6 did not effect the response on either side. D. P. C. L.

Epileptiform convulsions from remote excitation. F. A. FENDER (Arch. Neurol. Psychiat., Chicago, 1937, **38**, 259—267).—Imbedded leads from a secondary coil provided the stimulation when the animals were placed after postoperative recovery in a fluctuating electromagnetic field. The bared Ag tip of the active electrode was implanted in the desired region of the motor cortex. Following a 10—25 sec. stimulation epileptiform convulsions occurred which were closely similar to the convulsions of clinical epilepsy. These attacks continued for several min. Second and third stimulations 15—20 min. later resulted only in incomplete attacks. D. P. C. L.

Pupillary inequality in the cat following experimental lesions of the occipital cortex. W. H. WALLER and R. W. BARRIS (Amer. J. Physiol., 1937, **120**, 144—149).—Five unilateral and 2 bilateral occipital lesions were made on cats, so placed as to involve at least part of the posterior lateral gyrus, at the lower end of which is located the pupillo-constrictor area of Barris. Inequality of the pupils occurred; the pupil on the side opposite the lesion was usually wider, and more responsive to light and to painful stimuli. It is concluded that the cortical pupillo-constrictor area is concerned with the maintenance of the size of the pupils; the impulses probably reach the oculo motor nucleus by way of a cortico-pretectal tract. M. W. G.

Adequate shape and rate of stimuli in electrical stimulation of the cerebral motor cortex. O. A. M. WYSS and S. OBRADOR (Amer. J. Physiol., 1937, **120**, 42—51).—Motor cortex (area 4) and premotor cortex (area 6) were stimulated with single and repetitive condenser discharges of varying rising phase and duration, in 12 monkeys (*Macaca mulatta*) and one baboon (*Papio papio*) under light ether, chloralose, or dial anæsthesia. Single motor foci of area 4 react to single stimuli with a short twitch in the corresponding muscles. Optimum current duration was obtained with a rising phase between 7 and 20 milliseconds. From stimulation of area 6 a characteristic response was obtained down to 2 stimuli a second, but only with current pulses of max. stimulating efficiency. The response seemed to be due to simultaneous activity of areas 4 and 6. M. W. G.

Local action of eserine on central nervous system. F. R. MILLER (J. Physiol., 1937, **91**, 212—221).—Eserine sulphate (1%, occasionally 10%, in saline) was applied to the cerebral motor cortex of the cat under dial. After a latency of about 6 sec., the contralateral fore- or hind-leg shows tremors and soon develops general muscular rigidity together with a powerful clonus; eserine also produces a facilitation to faradism. The results are attributed to enhanced transmission at cortical synapses. Some similar results follow application of eserine to the cortex of the lobus anterior of the cerebellum. A. C.

Experimental neurosis in dogs. I. A. VETJUKOV (Trans. Physiol. Inst. Leningrad, 1936, **17**, 131—134).—An account of experimental neurosis produced in dogs by alternate production of two conditioned reflexes by two sets of stimuli, the first being sound reinforced by electrical stimulation of the paw, and the other being metronome beats with the giving of food. J. WA.

Survival and revival of nerve centres following acute anæmia. C. HEYMANS, J. J. BOUCKAERT, F. JOURDAN, S. J. G. NOWAK, and S. FARBER (Arch. Neurol. Psychiat., Chicago, 1937, **38**, 304—307).—The perfused isolated head was used to study the effect of anæmia, produced by clamping off the perfusion vessels, on the principal brain centres. Palpebral, pupillary, and motor reflexes disappeared after 4 min. of acute anæmia. After 15—20 min. these centres were definitely paralysed, but the vasomotor and respiratory centres could be easily revived, even after 30 min. of circulatory arrest. Similar observations were made on intact animals although these were revived only to die within 10—15 hr. After revival, these animals exhibited narcosis, coma, rigidity and hyperthermia, probably indicative of lesions in the cerebrum, which regions are apparently less resistant to anoxæmia than the respiratory and circulatory centres. D. P. C. L.

Cerebrospinal fluid pressure of man in the erect posture. E. A. CARMICHAEL, J. DOUPE, and D. J. WILLIAMS (J. Physiol., 1937, **91**, 186—201).—Of 35 subjects investigated, none suffered from any lesion causing increased intracranial pressure. While the subject sat in a chair with the legs immersed and moving gently in a tank of water at 44—45°,

plethysmographic records were taken of one digit of a hand by the method of Bolton *et al.* Ventricular (lateral) fluid pressure was recorded in 3 subjects, pressure in the cisterna magna in 15 subjects, and pressure changes in the lumbar sac in 12 subjects. Arterial pressure readings were taken by the auscultatory and other methods while venous pressure was recorded from the jugular bulb by means of a hollow needle inserted below the mastoid process. In the erect posture of man the alterations in intracranial cerebrospinal fluid pressure on quiet respiration and on taking a deep breath coincide in time and direction with alterations in arterial blood pressure; the increased negative pressure in the chest during inspiration is not transmitted along the jugular vein to within the cranium. Some evidence does not favour the control of the cerebral circulation of man by vaso-constrictor elements arising in or passing through the stellate ganglion and thence to the cerebral blood vessels. A. C.

Lumbar puncture pressures in subarachnoid hæmorrhage. R. Kemp (Lancet, 1937, **233**, 1369—1371).—Lumbar puncture pressures in 9 cases of subarachnoid hæmorrhage showed that most of the symptoms could not be attributed to increased thecal tension. C. A. K.

Vaso-active substances in human cerebrospinal fluid. H. Ude (Nervenarzt, 1937, **10**, 561—567).—No vaso-active substances have been found in normal human cerebrospinal fluid, as tested on the coronary vessels in the frog (Loewe-Trendelenburg prep.). Vaso-constrictor cerebrospinal fluid has been found in cases of pituitary obesity, Menière's disease, and arterial hypertension with cerebral arteriosclerosis. A. S.

Spinal parasympathetic and circulation. K. Kuré (Cardiologia, 1937, **1**, 95—121).—A review. A. S.

Loss of weight in the sympathectomised cat. A. Gasnier and A. Mayer (Ann. Physiol. Physiochim. biol., 1937, **13**, 605—619).—The loss of wt. of the sympathectomised cat varies from 0·2 g. to 0·6 g. per kg. per hr. D. T. B.

Effect of sympathectomy on fatty deposit in connective tissue. A. B. L. Beznák and Z. Hasch (Quart. J. Exp. Physiol., 1937, **27**, 1—15).—Cats, rabbits, and rats were kept on controlled diets, the fat of some of which was stained with Sudan III. In the cats the superior cervical and stellate ganglion were extirpated unilaterally and the splanchnic nerves divided on one side. In the rabbits and rats, the splanchnic nerves were divided. The perirenal, parietal, pericardial, mesenterial, and subcutaneous fat was removed and weighed and the Sudan III was determined by a method specially devised for the purpose. Laparotomy under ether anæsthesia causes a fall in the perirenal fat of cats; unilateral section of the splanchnic nerves diminishes the degree of fall, the perirenal fat weighing 200—300% more than on the intact side. The same difference is found if cats are allowed to starve, or if cats with very little perirenal fat are fattened, following splanchnicotomy in each case. In cats fed with Sudan-stained fat, the perirenal fat is stained equally on both sides. When they are starved after unilateral splanchnicotomy, the amount of fat on the ipselateral side is higher than on the normal. The concn. of Sudan III, however, remains on both sides the same as it was previous to splanchnicotomy and starvation. If cats and rats are fed stained fat, after splanchnicotomy and feeding on unstained fat, and killed 18 hr. later, the concn. on the operated side is about ¼ of that on the normal. Splanchnicotomy slows down both the deposition of fat and its mobilisation, especially the latter. Unilateral extirpation of other ganglia produces similar changes in other sites, and makes it probable that there is a general relation between fat storage and the sympathetic innervation of connective tissue in general. T. S. G. J.

Action of calcium on antonomic nervous system. P. Chauchard (Compt. rend. Soc. Biol., 1937, **125**, 1024—1026). D. T. B.

Humoral transmission of nerve impulses at central synapses. I. Sinus and vagus afferent nerves. H. C. Chang, K. F. Chia, C. H. Hsu, and R. K. S. Lim (Chinese J. Physiol., 1937, **12**, 1—36).—Central stimulation of the vago-sympathetic or sinus nerves of the isolated or severed head of a dog, viviperfused from its own trunk or from a donor, sometimes causes a rise of arterial pressure in the perfuser. Eserine potentiates the vagus or sinus, and cocaine the sympathetic effect. Atropine does not abolish the response to the vagus, but ergotoxine abolishes it more readily than the sympathetic response. A substance liberated on central vago-sympathetic stimulation increases intestinal motility. The blood from an eserinised head, tested on the leech and on the arterial pressure of a cat before and after atropine, has a slight cholinergic action, increased by vagal stimulation. Clamping off the perfuser's adrenals abolishes the vagal pressor effect, and the blood from them can be shown to contain adrenaline following the stimulation. It is concluded that central vagus or sinus stimulation causes liberation, at synapses in the brain, of acetylcholine, which then stimulates the secretion of adrenaline. Another pressor substance may also be produced. Central stimulation of the sympathetic similarly liberates sympathin. N. H.

Du Bois-Reymond and chemical transmission. (Sir) H. H. Dale (J. Physiol., 1937, **91**, 4P).—Chemical transmission of excitation from motor nerve endings to striated muscle was suggested by Du Bois-Reymond in 1877. A. C.

Synchronised reactions in optic ganglion of *Dytiscus*. E. D. Adrian (J. Physiol., 1937, **91**, 66—89).—The electric responses of this ganglion show that the neurones are often working synchronously, giving rhythmic potential waves and a grouped impulse discharge. In a fresh prep. a generalised rhythm is obtained only when the eye is exposed to very bright light. The "bright" rhythm lies between 20 and 40 per sec., declining in frequency with time; if the light is reduced, the potential waves disappear. Some hr. after the prep. has been made, a potential rhythm at 7—10 per sec. appears when the eye is in complete darkness; the "dark" rhythm is an abnormal reaction, and can be brought on by

injuring the ganglion; if the eye is exposed to the faintest light the waves disappear. When the dark rhythm has developed, the ganglion shows the two fixed potential rhythms corresponding with bright light and no light. Since bright light may cause a rhythmic after-discharge of declining frequency, the two rhythms are not due to two completely independent groups of neurones with fixed rates of response; the neurones can respond over a wide frequency range, and the fixed potential rhythms are those at which synchronisation can occur. A. C.

Discharge of impulses from ganglion cells. J. C. ECCLES (J. Physiol., 1937, **91**, 1—22).—A detailed account of work already noted (Physiol. Abs., 1936, **21**, no. 3991). A. C.

Action of moranyl on sympathetic excitability. A. KASWIN (Compt. rend. Soc. Biol., 1937, **125**, 947—949).—Injection of the anticoagulant moranyl (0·15 g. per kg.) in dogs diminishes the effect of splanchnic stimulation on blood pressure and adrenaline secretion. D. T. B.

Intrinsic gastro-intestinal fibres are connecting fibres. P. NOLF (J. Physiol., 1937, **91**, 1—2P).—The intrinsic gastro-intestinal fibres (fowl) are not themselves either motor or inhibitory fibres; they exercise their influence through the motor and inhibitory neurones contained in the wall of the gut. They belong to the system of connecting fibres previously described in the gastro-intestinal plexus of the bird. A. C.

Influence of temperature on "prickle sensation." H. FISCHER (Z. Sinnesphysiol., 1937, **67**, 149—158).—Stimulation of the skin with alternating currents causes a prickling sensation which, up to about 200 cycles per sec., follows the frequency of stimulation. Frequency changes of a few % can be distinguished within this range. Cooling the skin does not reduce the sensitiveness for frequency differences, nor lower the higher limit (200 per sec.) which the sensation is able to follow. At 40—45°, neither sensitiveness nor frequency range is increased, as compared with room temp. It is concluded that the sensation cannot originate from superficial receptors, but must be due to stimulation of nerve fibres or deep end organs. B. K.

Theories of formation and exit of intraocular fluids. J. D. ROBERTSON (Brit. J. Ophthal., 1937, **21**, 401—448).—The evidence for regarding the intraocular fluids as dialysates is unconvincing. Experiment shows expenditure of energy in the production of aq. fluid. Furthermore there is no chemical equilibrium between blood and aq. fluid, easily diffusible constituents such as urea, sugar, and uric acid being present in different concns. in blood and aq. fluid. The level of intraocular pressure is not maintained by the hydrostatic force in the capillaries minus the difference in osmotic pressure between aq. fluid and blood. The cumulative evidence points to the aq. fluid being produced by a process of secretion and that the circulation of the aq. fluid is determined by some other process than osmosis. A. So.

Dialysation of the intraocular fluids. W. S. DUKE-ELDER (Brit. J. Ophthal., 1937, **21**, 577—584).—Robertson (preceding abstract) advances no positive experimental proof that the aq. fluid is a secretion. The view that it is a simple dialysate is withdrawn. It is suggested that, having dialysed from the intraocular capillaries, and before reaching the chambers of the eye, the aq. fluid passes through a physiological membrane the properties of which maintain a concn. gradient to some mols. and a degree of unidirectional permeability to other mols. A. So.

Summation of subthreshold colour stimuli. W. KECK (Z. Sinnesphysiol., 1937, **67**, 159—174).—An apparatus for the application of rhythmic colour flashes of variable frequency and intensity is described. The summation of repetitive subthreshold stimuli is examined, on the dark-adapted eye, with foveal observation. With decreasing interval between successive stimuli, the threshold intensity at first remains const., then, as a certain "max. summation interval" is passed, decreases. The form of the summation curve and the val. of the max. summation interval (1·8—3·1 sec.) depend on the λ. B. K.

Summation of subthreshold colour flashes with normal and abnormal colour vision. F. SCHWARZ (Z. Sinnesphysiol., 1937, **67**, 175—188).—The method is the same as that of Keck (preceding abstract), but (i) successive flashes of alternating colour are employed, and (ii) cases of normal and pathological colour vision are compared. If complementary colours follow one another, the max. summation interval is greater than with alternating flashes of little colour difference (3·8 instead of 3·0 sec.). In cases of impaired colour sense (low sensitiveness for green) the summation interval for the affected colour is below normal, and equal to that for white. B. K.

Sensation of yellow and anomalous trichromatism. J. G. HAILWOOD and H. E. ROAF (J. Physiol., 1937, **91**, 36—47).—The range of the "yellow" region and the situation in the spectrum of its mid-position and the anomaloscope (Rayleigh, 1881) matches, were measured in 87 normal subjects and 13 hypochromats; readings were made on 10 separate days with 8 normal subjects and 2 hypochromats. The correlation between the positions of the "mid-yellow" λ and the anomaloscope readings is insignificant. There is a definite correlation between the "red"–"green" ratio and the intensity of "yellow" required to match the mixture. There is a much greater variability in the measurements made on hypochromats. A. C.

Excitation and inhibition in the off-effect of the retina. R. GRANIT and P. O. THERMAN (J. Physiol., 1937, **91**, 127—139).—The retinal electrical responses of excised, opened frog's eyes were recorded (string galvanometer, directly coupled amplifier). The retina was kept illuminated by one light, every now and then interrupted to give an off-effect; a 0·1 sec. flash from another lamp was made to precede the interruption of the adapting light or to fall just on top of the off-effect. The results indicate: (1) that some of the elements reacting at "off" also respond to the flash and are incapable of reacting with an off-effect

immediately after the flash has been delivered; (2) that the elements reacting to re-illumination with inhibition are independent and not identical with those that can be put out of function by a preceding flash. A. C.

Luminous efficiency of light entering the eye pupil at different points and its relation to brightness threshold measurements. B. H. CRAWFORD (Proc. Roy. Soc., 1937, **B**, **124**, 81—96).—Measurements were made of the luminous efficiency of light entering the eye through different parts of the pupil; the method used was determination of the threshold brightness corresponding with the various light paths. Results agree closely with those obtained by a method involving photometric matching of brightness, indicating a probability that the same visual mechanism is employed in both types of measurement. Luminous efficiency was investigated by the threshold method for various regions of the retina at a series of levels of brightness of the field of view from zero up to 22 c. per ft.^{2} Efficiency varies with brightness for parafoveal retinal areas; it has a well-defined max. near the centre of the pupil at high brightnesses and becomes almost const. over the area of the pupil at low and zero brightnesses. This is in contrast to the foveal area, for which efficiency distribution over the pupillary opening is scarcely affected by field brightness, and always has a max. near the centre of the pupil. The threshold method has also been used for determination, for parafoveal retinal areas, of the rate of change of efficiency distribution after sudden change of a high brightness to zero. The rate is apparently not inconsistent with the hypothesis of pigment migration or other mechanical movement of the retinal elements put forward to explain the phenomena. Results obtained have been combined with other measurements (of pupil size and of variation of threshold brightness using an artificial pupil) to give the response of the eye with its natural pupil. Comparison is made with measurements made directly with the natural pupil. There is fair agreement, which supports the method of combining a no. of visual factors which have been determined separately. F. B. P.

Absorption curve for visual purple and the electrical response of the frog's eye. R. GRANIT (Nature, 1937, **140**, 972).—The absorption curve of visual purple in the frog is compared with "physiological absorption," which is obtained by calculating the "effective intensity" from the luminosity curve constructed from potential measurements of the "*b*" deflexion in the electroretinogram. The two curves fit well for longer λλ, but for shorter λλ the absorption of visual purple is greater than "physiological absorption." C. A. K.

Effect of singing on peripheral vision. P. P. LASAREV and E. V. DOBROVOLSKAJA (Compt. rend. Acad. Sci. U.R.S.S., 1937, **16**, 271—272).—Estimations of maximal intensity of peripheral vision were obtained on subjects after 30—50 min. in the dark. These vals. were diminished by the singing of certain notes, by playing them on a scale, and when the subject was under the impression that they were being played. These subjects quickly regained their previous intensities on cessation of the experiments. Such experiments are interpreted as illustrating a change in sensibility of neighbouring portions of the nervous system, although those areas may not be under the influence of a stimulus. C. A. A.

Effects of central compensation in labyrinthectomised rats. Y. TANG and C. F. WU (Chinese J. Physiol., 1937, **12**, 117—124).—If the second labyrinth of a rat is destroyed not less than 5 days after the first, when nystagmus has ceased, the rat reacts for a few hrs. as though the second labyrinth only had been destroyed. N. H.

Cochlear potentials in man. G. V. GERSCHUNI, A. M. ANDREEV, and A. A. ARAPOVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, **16**, 429—430).—Experiments were carried out on 5 subjects in whom the ear-drum was destroyed. Two joined ebonite tubes, one carrying the electrodes and the other for the conduction of sound, were introduced into the external auditory meatus, and the sound was conveyed to the ear either from an ordinary whistle or from a rubber hose connected to a moving-coil speaker. A very powerful amplifier (× 800,000) was employed, but even with this oscillograph records could be obtained only from one subject. The oscillations ceased when the sound was interrupted. The difficulties associated with this type of work in man are discussed. C. A. A.

Increased acoustic sensitivity in dogs following Roentgen irradiation of the pituitary. W. J. BROGDEN and E. CULLER (Amer. J. Physiol., 1937, **119**, 13—23).—Lowering of the acoustic threshold is accompanied by a fall in the blood-sugar level. Similarly, insulin causes lowering of the acoustic threshold during the hypoglycæmic period in both normal and diabetic animals. R. N. C.

Mechanism of the lateral sense organs of fishes. A. SAND (Proc. Roy. Soc., 1937, **B**, **123**, 472—495).—The hyomandibular canal of the ray was perfused at a const. rate of flow by a technique which is described. Slow movement of fluid in the canal is the effective stimulus for the lateral sense-organs. Const. flow in the canal evokes a response which appears as an alteration in the spontaneous frequency of discharge of a single end-organ; response to such const. stimulation shows very slow adaptation. In a lateral-line canal, flow in one direction is excitatory; flow in the opposite direction is inhibitory. Evidence indicates that receptors which behave antagonistically with regard to the two directions of flow are mixed at random in the groups of sense cells in the lateral-line canals. The possibility of arresting or reducing the spontaneous frequency of discharge by a flow of fluid in the appropriate direction implies that the inhibitory process can occur in a peripheral sensory system. The lateral-line receptors obey the logarithmic law over the larger part of the effective range of intensity of stimulation. There is no evidence for the existence of any rapidly adapting receptors in the lateral-line canals. The lateral-line system is remarkably sensitive to low-frequency vibrations. There is modification or complete suppression of responses to vibration during an inhibitory perfusion of the canal. Direct mechanical stimulation of the

lateral line as well as vibrations propagated from a distance excite the receptors on account of the movements they cause to occur in the endolymph of the canals. Touch and pressure applied to the skin are incapable of furnishing a "constant" stimulation of the receptors, since movements of endolymph resulting from them are always transient. The relation of the lateral-line system to the labyrinth is shown by its mode of behaviour in functional activity as well as by its structure and development. F. B. P.

Thymus and exchange of water and salt. F. MARCONI (Arch. Sci. biol., 1937, **23**, 86—101).—In young rabbits removal of the thymus results in increased urinary excretion of Cl′ and H_2O. The effect is reduced by injection of extract of thymus or lymph gland. R. S. CR.

Electrocardiogram after parathyroidectomy. A. S. SEGURA (Compt. rend. Soc. Biol., 1937, **126**, 607—608).—The electrocardiogram in dogs after total parathyroidectomy shows tachycardia, diminished *P–R* interval, prolongation of systole, and changes in the *T* wave. D. T. B.

Changes in teeth following parathyroidectomy. I. I. SCHOUR, S. B. CHANDLER, and W. R. TWEEDY. **II. Effect of parathyroid extract and calciferol on incisor of rat.** I. SCHOUR, W. R. TWEEDY, S. B. CHANDLER, and M. B. ENGEL (Amer. J. Path., 1937, **13**, 945—970, 971—984).—I. The effects of parathyroidectomy on the incisor of the albino rat were studied in four groups: (1) short survival (3—20 days) after parathyroidectomy, (2) long survival, ($\nless$40 days), (3) with periodic fasting superimposed, and (4) with repeated pregnancies and lactation superimposed. In group 1 the post-operative dentine showed denser calcification than normal and was demarcated from the pre-operative dentine by a distinct ring ("calciotraumatic ring") staining deeply with hæmatoxylin, which appeared to be an acute response to the shock to Ca metabolism. The denser calcification is attributed to Ca retention. In group 2 there was defective calcification and defective formation of enamel and dentine, the severity varying directly with the survival time. In group 3 the changes were aggravated and in group 4 they were most severe.

II. 59 parathyroidectomised rats were divided into two roughly equal groups. The first group received 1—4 injections of parathyroid extract with a total dosage of 10—274 Collip units; they survived 3—17 days. The second group received a single administration of 46,000—644,000 international units of calciferol; they lived 1—10 days. The incisors were examined. Histologically both groups were similar and showed a primary response characterised by an eosin-staining zone and a secondary response of a hæmatoxylin-staining zone in the dentine, with, in most cases, a sharp hæmatoxylin-staining ring at the border of the pre- and post-experimental dentine, and in half of them, cytological changes in the active enamel-forming cells. In the calciferol group the serum-Ca rose during the first 3 days and then declined slowly to its original level, the level and rapidity of the rise increasing with the dosage. It is concluded that massive doses of calciferol do not necessitate the presence of the parathyroids to exert their effects. C. J. C. B.

Volume of the follicle in the normal human (Bantu) thyroid gland. H. B. STEIN (S. Afr. J. med. Sci., 1937, **2**, 61—69).—The follicle vol., as estimated by graphical reconstruction from serial sections, ranges from 8×10^{-6} to 4×10^{-3} cu. mm. >60% are below 10^{-4} cu. mm. Max. length varied from 9 to 309 μ. Follicle shape must be irregular as no correlation could be obtained between length and vol. of individual follicles. R. M. M. O.

Functions of thyroid. F. BLUM (Endokrinol., 1937, **19**, 19—30).—Exophthalmos and enlargement of the thyroid in rabbits, guinea-pigs, rats, and goats can be produced by prolonged feeding with various kinds of cabbage. The average wt. of a rabbit's thyroid (0·1 g.) was increased to 15 g.; the increase begins after 14 days. The offspring of these rabbits were born with enlarged thyroids. Small doses of I (5—10 μg.) added to the cabbage produce a considerable increase of the basal metabolic rate. A. S.

Hyperthyroidism in the negro. W. B. PORTER and H. WALKER (Ann. Int. Med., 1937, **11**, 618—625). C. A. K.

Culture of whole organs. II. Effects of perfusion on the thyroid epithelium. H. OKKELS (J. Exp. Med., 1937, **66**, 297—304).—Cultivation of whole thyroid gland in the Lindberg apparatus is described. Using the thyroids of cats and rabbits, no interference with the cellular activity of the glands was found even when cultivation was continued for 6 days. Changes in the mitochondria and Golgi organs of the cultured cells were seen on histological section. Addition of thyrotropic pituitary substance to the perfusion fluid caused stimulation of the cultivated gland. A. C. F.

Metabolism and action of di-iodotyrosine and *N*-benzoyldi-iodotyrosine. I. SNAPPER and A. GRUNBAUM (Brit. J. Exp. Path., 1937, **18**, 401—405).—Oral or subcutaneous administration of di-iodotyrosine to patients was followed by degradation of this substance to inorg. I which can be demonstrated in the saliva within 50 min. *N*-Benzoyldi-iodotyrosine and di-iodohydroxyhippuric acid, however, were recovered unaltered from the urine. Those compounds which are not altered by the body do not have any beneficial effect in patients with exophthalmic goitre. The immunochemically important $6:1:2\text{-}C_6H_2I_2\cdot OH$ group of the di-iodotyrosine cannot therefore be the active group in the treatment of patients with hyperthyroidism. R. L. N.

Increased urinary excretion of iodine in hyperthyroidism. G. M. CURTIS and I. D. PUPPEL (Arch. Int. Med., 1937, **60**, 498—508).—The average val. for urinary I in 40 patients with hyperthyroidism investigated over a period of 298 days was 184 μg. per day compared with a normal average of 51 μg. The variability of the daily urinary excretion of I in hyperthyroidism was much greater than that of the normal urinary excretion of I. T. H. H.

Removal of sodium cholate from the blood and its secretion into the bile as affected by thyroxine. L. H. SCHMIDT (Amer. J. Physiol., 1937, **120**, 75—

82).—Na cholate was removed from the blood of normal rabbits very rapidly. The process is delayed by treatment with thyroxine in proportion to the dose used. Only a small amount of the total Na cholate injected was excreted in the urine in both normal and treated animals. The results indicated that the retention of Na cholate in the blood of the treated rabbits was due to the inability of the liver to secrete this bile salt into the bile, probably as the result of liver injury. M. W. G.

Immunity to iodothyroglobulin does not affect its physiological action. S. H. Roscu and D. Marine (Amer. J. Physiol., 1937, **120**, 121—125).—Iodothyroglobulin solutions were prepared from fresh ox thyroid glands by the method of Oswald. Five adult rabbits received 11—28 triweekly injections immediately after metabolism tests during experimental periods of 39—84 days. The dose was 5—20 c.c. for each animal. For the precipitin tests blood was obtained from the ear veins at 10-day intervals. In all instances a small but definite sustained increase in heat production and a relatively small but significant precipitin response, both commensurate with the relatively low concns. of the injected iodothyroglobulin solutions, resulted. In no instance did the injections result in the development of tolerance or refractoriness in spite of the definite immune response. M. W. G.

Reactivity of thyroid of rabbit to thyrotropic hormone of the anterior pituitary. K. N. Sinha (Quart. J. Exp. Physiol., 1937, **26**, 331—337).—Injection of preps. of thyrotropic hormone increased the metabolic rate of normal and partly or completely hypophysectomised rabbits. Intramuscular injection produced the increase earlier than subcutaneous injection. The metabolic rate of rabbits is lowered by hypophysectomy. T. S. G. J.

Action of thyrotropic pituitary hormone on guinea-pigs and rats. K. Heinemann (Endokrinol., 1937, **19**, 1—9).—Intraperitoneal injections of thyrotropic pituitary hormone in rats and guinea-pigs produce typical exophthalmic goitre. The severe degenerative changes in heart and liver, which have been described in Graves' disease in man, could not be demonstrated. A. S.

Antithyrotropic effect of the serum of normal and thyroidectomised rabbits. C. H. Chou (Chinese J. Physiol., 1937, **12**, 155—162).—Normal and thyroidectomised rabbits were injected with thyrotropic hormone for 40 days. 50 immature guinea-pigs in 5 groups were injected with: (1) nothing, (2) thyrotropic hormone, (3) thyrotropic hormone + 2 c.c. of serum of a normal rabbit, (4) thyrotropic hormone + 2 c.c. of serum of a normal injected rabbit, (5) thyrotropic hormone + 2 c.c. of serum of a thyroidectomised injected rabbit. The guinea-pigs' thyroids were weighed and sectioned. The thyroids of groups 2 and 3 were markedly stimulated; those of groups 4 and 5 only slightly. N. H.

Changes in pituitary gland following total thyroidectomy. M. D. Altschule and P. Cooper (Arch. Path., 1937, **24**, 443—453).—The pituitary glands in 5 patients with post-operative hypothyroidism showed increase in no., size, and degree of vacuolation of the basophil cells and less striking diminution in the size of the eosinophil cells. In 4 of the cases the pituitary gland was increased, whilst in the fifth it was normal in size. The authors suggest that spontaneous hypothyroidism in man may be due either to atrophic changes in the pituitary gland or to a primary atrophy of the thyroid gland itself. A full bibliography is given. C. J. C. B.

Transient hyperthyroidism after hypophysectomy in albino rats. C. Gessler (Acta. brev. neerl. Physiol., 1937, **7**, 14—15).—In rats after hypophysectomy there is a transient rise in basal metabolic rate followed by a fall. T. F. D.

Culture of whole organs. III. Antihormones studied on isolated living thyroid glands. H. Okkels (J. Exp. Med., 1937, **66**, 305—316).—Study of whole thyroid gland cultures from rabbits shows that glands from animals refractory to thyrotropic pituitary substance still respond when the thyrotropic substance is added to the perfusion fluid. Serum from a refractory animal does not completely neutralise the stimulating effect of the thyrotropic pituitary substance. It is concluded that tissues other than the thyroid gland must play a part in the development of refractoriness to thyrotropic pituitary substances. A. C. F.

Effect of deficiency and excess of thyroid hormone in the maternal organism on the thyroid gland of the fœtus. Effect of partial parathyroidectomy on delivery. S. Skowron, Z. Wiciński, and S. Zajączek (Bull. Acad. Polonaise, 1937, **B** II, 151—167).—Penetration of administered thyroid hormone into the placenta (rabbit) appears to occur, an inhibitory action on the maternal thyroid gland and a stimulatory effect on the fœtal gland being induced. Lack of parathyroid hormone increases the period of delivery. F. O. H.

Antihormones. V. Kindermann and F. Eichbaum (Klin. Woch., 1937, **16**, 430—431).—After daily treatment of rabbits with thyrotropic substances, antibodies to the homologous antigen were recognisable about the 13th day. Simultaneously the initial increase in the pulse rate began to pass off. The sera of animals treated with the thyrotropic substance from oxen reacted serologically only weakly with that from pig hypophysis and the reverse held good. The refractory phase in animals treated with ox hypophysis was overcome by the administration of pig hypophysis. The protein-like hormone thus exhibited sp. characters. F. W. L.

Influence of cocaine and procaine on vascular action of adrenaline. K. O. Møller (Arch. int. Pharmacodyn., 1937, **57**, 51—63).—The constrictor action of adrenaline on the vessels of the perfused ear (rabbit) is potentiated by cocaine but not by procaine. In concns. producing a strong vasoconstriction procaine almost entirely abolishes the action of adrenaline. Cocaine and procaine markedly constrict the vessels of the ear owing to a direct action on the muscle fibres. D. T. B.

Effect of cocaine and procaine on hyperglycæmic action of adrenaline. K. O. Møller

and K. STEFANSSON (Arch. int. Pharmacodyn., 1937, **57**, 35—44).—Cocaine markedly potentiates the hyperglycæmic action of adrenaline in rabbits; procaine has only a slight potentiating action. D. T. B.

Reversal of adrenaline effects by 933 F. U. LOMBROSO and C. ZUMMO (Arch. Sci. biol., 1937, **23**, 14—21).—The reversal of the effect on arterial pressure is not due to an action on the parasympathetic since it is unaffected by atropine. Toad venom closely resembles adrenaline in its physiological actions, but it still produces a rise of blood pressure after administration of 933 F. R. S. CR.

Relation of potassium to the blood pressure response to adrenaline. P. S. LARSON and G. BREWER (J. Pharm. Exp. Ther., 1937, **61**, 213—217; cf. Camp and Higgins, A., 1936, 1425).—In eviscerated, hepatectomised cats, the serum-K level is increased only slightly or not at all by injecting 0·02 or 0·04 mg. of adrenaline, there being no correlation between the increase in blood pressure and that in serum-K. There is no evidence that the sympathomimetic action of adrenaline appears only after a const. K threshold has been reached. W. McC.

Alternation of the ventricles following adrenaline injection. E. DE SOMER (Cardiologia, 1937, **1**, 159—185).—Intravenous injection of adrenaline in anæsthetised dogs produces ventricular alternation. This may be due to disturbances of the pulmonary circulation. A. S.

Influence of folliculin on uterine action of adrenaline. J. DAELS and H. HANDOVSKY (Compt. rend. Soc. Biol., 1937, **126**, 428—431).—Treatment of the non-gravid cat with folliculin leads, as in the gravid animal, to inversion of adrenaline action on the uterus. D. T. B.

Rôle of liver and abdominal organs in destruction of adrenaline. Z. M. BACQ (Arch. int. Physiol., 1937, **45**, 1—5).—After evisceration or during the temporary arrest af the visceral circulation in cats, the action on the denervated nictitating membrane of adrenaline (injected into the crural vein) is not increased > would be expected because of the reduction of tissues to which the adrenaline is distributed. The passage of adrenaline through the liver does not alter its effect on the denervated membrane or on the virgin uterus. *In vivo* the liver and abdominal viscera do not destroy adrenaline more than do other tissues. C. E. B.

Adrenaline content of human peripheral blood in exercise. F. MEYTHALER and K. WOSSIDLO (Klin. Woch., 1937, **16**, 658—662).—Adrenaline was estimated by the vasoconstrictor effect on the rabbit's ear when perfused with the subject's blood taken from the cubital vein; blood-sugar was determined simultaneously. A cold bath produced an outpouring of adrenaline and a decrease in the blood-sugar; the latter is attributed to increased oxidative processes. Hyperthermia by radiant heat and excitement produces a marked increase in adrenaline secretion. Light and moderate muscular activity (running) produces a positive adrenaline reaction in the peripheral blood but after excessive and exhausting work no trace can be found. The blood-sugar in both cases at first diminishes, to rise again during the later phase of recovery. F. W. L.

Adrenaline content of the mammalian heart. O. LOEWI, R. HAGEN, and G. SINGER (Arch. int. Pharmacodyn., 1937, **57**, 139—140).—The auricle and ventricle of the guinea-pig have the same adrenaline content (1—2 μg. per g.). D. T. B.

Influence of destruction of adrenal medulla on emotional hyperglycæmia in rats. R. F. HARRIS and D. J. INGLE (Amer. J. Physiol., 1937, **120**, 420—422).—Normal rats showed an increase in the level of blood-sugar in response to emotional excitation; rats with the adrenal medulla destroyed showed a decrease in blood-sugar under identical experimental conditions. 15 animals with transplanted adrenal glands given injections of adrenaline showed an average maximal rise of 40 mg. per 100 c.c. M. W. G.

Potential changes in frog's adrenals during illumination of body. B. HASAMA (Pflüger's Archiv, 1937, **238**, 758—766).—Weak periodic currents can be led off from the adrenals of frogs kept in light; these are usually absent in the dark. If a frog kept in the dark is exposed to direct sunlight the adrenal becomes electro-negative; this electro-negativity gradually rises to a max. and then decreases, even if the illumination is maintained. The potential changes are regarded as a concomitant of increased adrenaline production. Injection of nicotine also increases the negative potential of the adrenals. J. M. R.

Effects of adrenal destruction in the frog. J. MAES (Arch. int. Physiol., 1937, **45**, 135—188).—The adrenals in 400 frogs were destroyed with a special electro-cautery; in 300 controls another aspect of the kidney was cauterised. The symptoms of adrenal deficiency resemble those of mammals. Survival time is lengthened by external cold. Circulatory failure and asthenia advance together but are not due to heart failure. The weakness depends on changes in the central nervous system since normal fatigue curves may be obtained from isolated muscles. The isolated sciatic nerves, on the contrary, after a few min. faradic stimulation at high frequency, show a decreased conduction rate and amplitude of potential compared with the controls. Certain pathological conditions which slow the circulation do not produce the fatigue of peripheral nerve fibres. The skin of many adrenal-deficient animals darkens. The fall of blood-sugar and the exhaustion of glycogen in liver and muscles is less than occurs during starvation. The nerve changes seem to be of fundamental importance. C. E. B.

Serum-potassium or -sodium as altered by adrenalectomy and nephrectomy. E. M. MACKAY, H. C. BERGMAN, and L. L. MACKAY (Amer. J. Physiol., 1937, **120**, 83—86).—Male rats (200 g. wt.) after fasting 48 hr. were used. Bilateral adrenalectomy greatly reduced the survival time of the rats made uræmic by bilateral nephrectomy. This result is attributed to retention of a toxic substance (not K). M. W. G.

Influence of adrenal cortical hormone on electrolyte and fluid distribution in adrenalectomised dogs maintained on a sodium- and chloride-free diet. W. W. SWINGLE, W. M. PARKINS, A. R. TAYLOR, and H. W. HARP (Amer. J. Physiol., 1937, **119**, 684—691).—Normal dogs with intact adrenals kept on a salt-free diet for 2 weeks retained normal health and vigour and showed no change in serum-Na and -Cl, though the blood was concentrated as shown by a rise in hæmoglobin and red-cell count. Urinary losses of Na, Cl, and water are not necessary accompaniments of severe adrenal insufficiency. Severe adrenal insufficiency with hæmo-concn., dehydration, and circulatory collapse can occur without significant change in the serum-Na and -Cl or -K. The mobilisation and redistribution of body-fluid following cortex hormone injection were associated with a redistribution of electrolytes. Thus a total of 75 c.c. of extract containing 9·8 m.-equiv. of Na and Cl was injected; during recovery the dog excreted 10·9 m.-equiv. of Na and 18·3 m.-equiv. of Cl; *i.e.*, the animal eliminated more of these electrolytes during recovery than it received and yet the serum concn. of Na and Cl increased despite the evident expansion of the extracellular fluid vol. M. W. G.

Actions of cortical hormone of the adrenals. T. LÁSZLÓ (Cardiologia, 1937, **1**, 219—233).—Simultaneous removal of both adrenals produces no changes in the conducting tissue of the heart in dogs examined shortly before the time of expected death. Some cortical preps. ("pancortex," "cortin") have no effect on isolated Purkinje fibres; "cortigen" increases the contractions; ascorbic acid ("cebion") diminishes force and frequency of contractions. In the heart–lung prep. (dog) small doses of "pancortex" produce constriction, larger doses dilatation, of the coronary arteries. The variability of responses is attributed to impurities in the extracts used. A. S.

Method for standardising cortical hormone. J. H. GAARENSTROOM, L. WATERMAN, and E. LAQUEUR (Acta brev. neerl. physiol., 1937, **7**, 10—13).—A method of cortin standardisation dependent on muscular exhaustion is based on measurement of "swimming times" of rats before sinking in water. T. F. D.

Purification of adrenal extracts and isolation of an activator of male sex hormones. M. EHRENSTEIN and S. W. BRITTON (Amer. J. Physiol., 1937, **120**, 213—221).—An acid Na salt of palmitic acid, $C_{15}H_{31}\cdot CO_2H,C_{15}H_{31}\cdot CO_2Na$, was isolated from the adrenal cortex. In young castrated male rats the activating effect of this salt on testosterone is several times that of free palmitic acid. Evidence of the presence of acid soaps other than that of palmitic acid was obtained. A modified method for the prep. of cortico-adrenal extract was described. By its use adrenalectomised dogs could be maintained alive indefinitely in apparently normal health. By fractionation more refined extracts showing much greater physiological activity were obtained. A chromatographic absorption fractionation technique for cortico-adrenal extracts is also described. An amorphous *compound*, m.p. 92—94°, C 74·03, H 12·19, N 2·30%, derived from the adrenal glands was isolated. It was ineffective on adrenalectomised animals and ovariectomised rats when given in appropriate doses. M. W. G.

Action of adrenotropic hormone. M. LATYSZEWSKI (Compt. rend. Soc. Biol., 1937, **126**, 468—470).—Pituitary adrenotropic hormone produces cytological changes in the zona fasciculata of guinea-pigs and rabbits. D. T. B.

Effect of œstrus (pseudopregnancy) and certain pituitary hormones on the life-span of adrenalectomised animals. W. W. SWINGLE, W. M. PARKINS, A. R. TAYLOR, H. W. HAYS, and J. A. MORRELL (Amer. J. Physiol., 1937, **119**, 675—683).—Œstrus in the dog is followed by pseudopregnancy which lasts about as long as normal pregnancy. During pseudopregnancy untreated adrenalectomised dogs remained in good health and without change in serum-Na and -Cl; towards the end of the period hæmo-concn. and fall of blood pressure occurred. Progesterone did not prolong life in adrenalectomised dogs or cats, nor did ovarian or anterior pituitary extracts help adrenalectomised bitches (not in heat). Anterior pituitary extracts prolonged life in adrenalectomised normal and castrated cats, so the action was not via the gonads. Extract of menopausal urine produced œstrus in the dog. M. W. G.

Effect of the adrenals on the pituitary. I. Changes in the melanophoric hormone content of the pituitary and of blood caused by adrenaline and cortidyn. A. JORES (Z. ges. exp. Med., 1936, **97**, 805—812; Chem. Zentr., 1936, i, 4318).—Intraperitoneal injection of single large doses of adrenaline and cortidyn in mice causes an abrupt decrease in the amount of melanophoric hormone in the pituitary, original levels being regained in 1 and 6 hr. respectively. In man, rabbits, and rats further evidence of the antagonism between the melanophoric and adrenal hormones is established. A. G. P.

Stimulating action of hypophysis on adrenal cortex and medulla. A. W. ELMER, B. GIEDORZ, and M. SCHEPS (Compt. rend. Soc. Biol., 1937, **125**, 1082—1085).—Anterior hypophyseal extracts injected into rat or mouse have no action on cortex or medulla of adrenal but stimulate cortex of adrenal of guinea-pig. This latter action is inhibited by I. D. T. B.

Adrenalectomy in mice, and the replacement of *X*-zone-bearing adrenals by cortical extract with special reference to adrenal gonad relationships. E. HOWARD (Amer. J. Physiol., 1937, **120**, 36—41).—Male mice 3 weeks of age were adrenalectomised; if extirpation is complete death follows after a short period of inhibited growth. To test the ability of extracts of non-*X* zone-bearing adrenals to replace glands with an *X* zone, young female mice 21 days old were adrenalectomised and treated orally with an excess of cortical extract made from pig adrenals. Body growth was maintained at a practically normal level, thus showing that removal of the *X* zone can be compensated by an extract devoid of *X* zone. The *X* zone in female mice does not inhibit the maturation of the female reproductive system. M. W. G.

Standardisation of insulin. F. MEYTHALER and A. BINGEL (Klin. Woch., 1937, **16**, 589—591).—Rabbits of the same breed (average wt. 2000 g.) were, after a 24-hr. fast, injected in the ear veins with 1 unit of insulin per kg. (an amount found by preliminary tests to be just sufficient to produce convulsions). The blood-sugar was determined at intervals of 10 to 15 min. by the Hagedorn–Jensen method. The vals. returned to normal within 5 hr. The animals could be used again after an interval of 4—5 days. The intensity of action was measured planimetrically on the graphs of the sugar vals. The results showed a marked agreement in rabbits of equal wt., but varied directly with increase in the body-wt. The constancy in animals of similar wts. offers the possibility of a more exact measurement of insulin strength than by the usual subcutaneous method, and avoids variations in the rate of absorption. F. W. L.

Insulin, glukagon, and diabetes. M. BÜRGER (Klin. Woch., 1937, **16**, 361—363).—Exercise hyperglycæmia of the diabetic occurs in spite of the small stores of liver-glycogen and persists longer than in normal subjects. The increase that follows intravenous injection after exercise is less than without exercise, so there is not complete inability to metabolise the carbohydrate. Diabetic hyperglycæmia results from accelerated transformation of other material into sugar. In the normal horse less fat was found in venous blood from muscles than in the arterial. Diabetic blood renders cryst. insulin inactive more rapidly than normal blood; *e.g.*, 4 c.c. destroys 40 μg. in 14 hr., whilst healthy blood requires 30—40 hr. The hyperglycæmic principle of the pancreas (glukagon of Murlin), which is generally considered to be an impurity in insulin preps., mobilises liver-glycogen, producing a hyperglycæmia on intravenous injection. An injection of 20 μg. per kg. of the author's purest prep. increased blood-sugar in the rabbit by 50%. It will also act in the adrenalectomised animal. The extent and duration of the hyperglycæmia of muscular work in the diabetic are attributed to a disturbance of the normal relation between glukagon and insulin production. F. W. L.

Hyperinsulinism: final report of case including necropsy observations. E. ZISKIND, W. BAYLEY, and E. F. MAUER (Arch. Int. Med., 1937, **60**, 753—771).—Studies were made on a patient with hyperinsulinism over a period of 4 years. Dinitrophenol retarded the increasing obesity. The ingestion of glucose raised the blood-inorg. PO_4. The spinal fluid pressure was elevated in the hypoglycæmic attacks, and there was a long latent period between the fall in the sugar content of the blood and that of the spinal fluid. The intradermal saline test did not reveal a state of dehydration in the skin during the hypoglycæmic phase. Necropsy revealed an adenoma of the pancreatic islets. T. H. H.

Structure of insulin. See A., 1937, I, 604.

Factors influencing the prognosis in diabetic coma. E. S. DILLON and W. W. DYER (Ann. Int. Med., 1937, **11**, 602—617).—From a study of 224 patients it was found that clinical data, *e.g.*, the mental state, the age, duration of acidosis, and complications present, form a much more trustworthy guide in the prognosis of diabetic coma than biochemical data, *e.g.*, blood-sugar, alkali reserve, and blood-urea. C. A. K.

Adrenals and experimental pancreatic diabetes. J. M. ROGOFF and H. W. FERRILL (Arch. Int. Med., 1937, **60**, 805—816).—In depancreatised dogs reduction or suppression of adrenaline from the adrenals does not modify the severity of the diabetes. Depancreatised dogs kept for several weeks on a const. diet with adequate amounts of insulin to control glycosuria show a reduction or suppression of output of adrenaline. T. H. H.

Insulin-hypoglycæmia treatment of schizophrenia. D. E. CAMERON and R. G. HOSKINS (J. Amer. Med. Assoc., 1937, **109**, 1246—1249).—17 cases of schizophrenia completed intensive insulin treatment during the past year. The original technique of Sakel was closely followed except that intravenous glucose was more freely used in terminating the reaction. The dangers associated with the treatment are discussed. 2 cases showed an apparent cure, and 5 considerable improvement, while 5 were unchanged. The insulin method appears to be a promising therapeutic approach to the schizophrenic problem. A % of recoveries as high as claimed from some European centres has not been obtained, but this may be due to inexperience or the difficulty in assessing the completeness of recoveries. R. L. N.

Hypoglycæmic treatment of schizophrenia. C. A. RYMER, J. D. BENJAMIN, and F. G. EBAUGH (J. Amer. Med. Assoc., 1937, **109**, 1249—1251).—7 cases of schizophrenia were treated by insulin hypoglycæmia. 2 were unaffected, but 5 showed a marked improvement. R. L. N.

Effect of diabetogenic hormone of anterior pituitary on blood-sugar. K. I. ANSELMINO (Endokrinol, 1937, **19**, 30—33).—Diabetogenic hormone was obtained from human serum after ingestion of 150 g. of glucose. The hormone was injected subcutaneously into rats which were killed 1—6 hr. later. In spite of a diminution of liver-glycogen to below 10% of the pre-injection level, there was no significant change in blood-sugar. A. S.

Ketogenic action of anterior pituitary. B. A. HOUSSAY and C. T. RIETT (Compt. rend. Soc. Biol., 1937, **126**, 620—622).—Ketogenic anterior pituitary hormone raises the blood-ketones in rats after removal of thyroid, pituitary thymus, or gonads. In adrenalectomised animals the effect is potentiated by cortin or by regeneration of cortical tissue. D. T. B.

Pancreatropic hormone of pituitary and islets. B. CHRZANOWSKI and S. J. GRZYCKI (Klin. Woch., 1937, **16**, 488—491).—Subcutaneous injection into rats of an ultra-filtrate of the anterior pituitary prepared by the method of Anselmino and Hoffmann caused hypertrophy and new formation of pancreatic islets. The newly formed islets arose from single scattered cells which, according to Saguchi, belong to the islet system. These may originate from the gland parenchyma, single zymogen cells separating themselves from the acini and changing their functional properties. No changes were seen in the

ordinary parenchyma cells. Negative results were obtained with aq. solutions of ordinary extracts and were attributed to a hormone inhibiting the pancreotropic hormone. F. W. L.

Cushing's disease. E. W. BRAUER (Endokrinol., 1937, **19**, 10—19).—Report of a case of Cushing's disease with basophil adenoma of the anterior pituitary. Adrenotropic hormone was demonstrated in the urine, and blood-cholesterol was increased to 0·18%. A. S.

Reticulo-endothelial system and adrenotropic hormone. M. REISS and I. GOTHE (Endokrinol., 1937, **19**, 148—151).—The phagocytic activity of the reticulo-endothelial system in rats towards lithiocarmine is enormously increased following previous injections of adrenotropic hormone of the anterior pituitary. A. S.

Restropic effects of anterior pituitary extracts. C. WETZLER-LIGETI and B. P. WIESNER (Nature, 1937, **140**, 892—893).—"Res" in "restropic" = r.e.s. = reticulo-endothelial system. Anterior pituitary extracts (free of growth factor, but sometimes containing traces of gonadotropic and thyrotropic factors) increased the activity of the r.e.s. of rabbits, as shown by more rapid removal of Congo-red from the blood stream. Purified gonadotropic hormones had no action, and strongly thyrotropic extracts diminished the rate of removal of the dye. C. A. K.

Morphological changes in the pituitaries of rats resulting from combined thyroidectomy and gonadectomy. I. T. ZECKWER (Amer. J. Path., 1937, **13**, 985—992).—The pituitaries of 32 male and 30 female white rats thyroidectomised and gonadectomised at the same time (35—40 days of age) were studied 44—171 days after operation and compared with the pituitaries of 200 rats which had been thyroidectomised only and with 29 rats castrated only. Greater hypertrophy of the pituitary occurred after the combined operation than after either thyroidectomy or gonadectomy alone. After the combined operation both thyroidectomy and castration cells were present in the pituitary. Acidophils degranulate and largely disappear as after thyroidectomy alone. The loss of acidophils was associated with retardation of visceral growth. C. J. C. B.

Effect of hypophysectomy on arterial blood pressure of dogs with experimental hypertension. I. H. PAGE and J. E. SWEET (Amer. J. Physiol, 1937, **120**, 238—245).—Hypertension of the order of 240—160 mm. Hg was produced in dogs by constricting the renal arteries with Goldblatt's clamp. It was maintained for several months. Hypophysectomy in these animals reduced the arterial pressure to levels slightly above or below normal within 20 days. Increasing the constriction of the renal arteries after hypophysectomy produced a rise in blood pressure, which was less marked in dogs which became sluggish and fat and exhibited reduced basal metabolism; the rise was maintained in dogs with normal or elevated basal metabolism. After hypertension was reduced by hypophysectomy, feeding thyroid (0·8 g.) raised the blood pressure moderately. Injection of theelin (1 c.c. daily) or antiutrin *S* (1 c.c. daily) had no effect. It was concluded that hypophysectomy alters the reactivity of the vascular system by diminishing the activity of the adrenal cortex and thyroid in such a manner that it no longer responds as well to chemical stimuli resulting from constriction of the renal artery. M. W. G.

Superfecundity in rats treated with mare gonadotropic hormone. H. H. COLE (Amer. J. Physiol., 1937, **119**, 704—712).—Subcutaneous injections were made on mature and immature rats. The mature rats were injected with 3—24 rat units in diœstrum, œstrus, and metœstrum. The average litter size and the % of large litters were increased by injecting 12 rat units in metœstrum, but no litter exceeded in size the largest found in control animals. Only in the immature animal did the injections result in superovulation and in the implantation of a no. of fœtuses far exceeding that found in the normal mature female. Excessive dosages reduced the % of fertile matings in both mature and immature rats. Implantation of fœtuses occurred in rats injected on the 22nd day and mated on the 25th day of age. Of rats injected on the 26th—31st day of age 49% mated. An astonishing no. of implanted fœtuses were found after necropsy on the 10th—12th day of pregnancy. Of the rats sacrificed at this time 38% had more than 20 fœtuses. M. W. G.

Effect of hæm on action of pituitary gonadotropic extracts. W. H. MCSHAW and R. W. MEYER (Amer. J. Physiol., 1937, **119**, 574—579).—Whole blood, hæmolysed erythrocytes, hæmoglobin, and hæm greatly augmented the effect of anterior pituitary gonadotropic extracts on the ovaries of immature rats when mixed before injection. Augmentation was not observed when the hæm or whole blood was injected separately and in such a way that no mixing occurred before absorption. Porphyrin and globin prepared from hæmoglobin and $FeCl_2$ and $FeCl_3$ had no augmentive action. M. W. G.

Influence of infections on hypophyseal gonadotropic activity. E. B. DEL CASTILLO (Rev. Soc. argent. Biol., 1937, **13**, 163—169).—F', Tl acetate, diphtheria toxin, and infection with *Trypanosoma equiperdum* do not alter gonadotropic activity of hypophysis, hypophyseal extracts, or transplants. J. T. L.

Hormonal relation between pituitary, thyroid, and the iodine content of the brain. G. PIGHINI (Biochim. Terap. sperim., 1935, **22**, 607—624; Chem. Zentr., 1936, i, 3855).—The I content of the cerebral cortex and mesencephalon in dogs was markedly increased (50—300%) by injection of thyroxine or thyroxine + anterior pituitary emulsion, by oral administration of thyroid powder with or without injection of the pituitary emulsion, or by pituitary injection only. A. G. P.

Changes of colour by injection of pituitary extracts in a dogfish (*Scylliorhinus canicula*). D. R. BARRY (Nature, 1937, **140**, 769—770).—Intraperitoneal injections of Post-hypophyse Choay No. 4 and Zoo-Postlobye Roussel extracts produced temporary darkening in the colour of an abnormally light-coloured dogfish. L. S. T.

Anterior pituitary and growth and differentiation in amphibia. A. A. VOITKEVITSCH (Compt. rend. Acad. Sci. U.R.S.S., 1937, **14**, 403—410).—When small pieces of anterior pituitary containing eosinophil tissue were added to the larvæ of developing tadpoles the rate of growth was increased and bigger animals resulted. A single implantation at the larval stage led to frogs of 2—3 times the control size. Similar experiments using the basophile tissue (thyrotropic hormone?) showed, on the contrary, acceleration of metamorphosis, rapid resorption of the tail, and decrease of body-wt. Similar results were obtained with axolotls. C. A. A.

Experimental hypophyseal transplantations. E. KYLIN (Klin. Woch., 1937, **16**, 447—448).—Small portions of calf hypophysis were placed in pockets of peritoneum of rabbits. After 1½ months the hypophyseal parenchyma showed necrosis in its central parts, but normal staining reactions in the periphery. Better preps. were obtained 3 months after implantation. All 3 types of cells were present and vascularisation had occurred. In cases where the hypophyseal capsule was present there was a greater tendency to necrosis. The experiments demonstrate the possibility of implants remaining functional, growing, and becoming vascularised. F. W. L.

Pituitary implantation in man and animals. E. KYLIN (Acta med. scand., 1937, **91**, 428—434).—Excellent growth and survival rates were obtained in animals from which the hypophysis had been removed, and into which small pieces of the gland of other animals both of the same and other species were introduced into the peritoneum. In 28 cases of Simmonds' disease, very good results over a subsequent period of 2 years were obtained in most of the cases following implantation into the omentum of very small pieces of calf hypophysis. For success the tissue must be very fresh and the capsule must be removed. C. A. A.

Action of prolactin on frog testis. H. A. SHAPIRO (S. Afr. J. med. Sci., 1937, **2**, 121—123).—A prolactin-containing extract of sheep anterior pituitary caused stimulation of the gonads in male frogs. After subjecting the extract to a temp. which was adequate to destroy gonadotropic hormones but left 25% of the original prolactin activity, it had no action on the frogs' testes. R. L. N.

Anti-gonad action of prolactin in pigeons. R. W. BATES, O. RIDDLE, and E. L. LAHR (Amer. J. Physiol., 1937, **119**, 610—614).—The anti-gonad effects of prolactin in adult birds is an indirect one on the birds' pituitary, where it exerts an inhibitory action on the release of follicle-stimulating hormone; this leads to rapid and extensive atrophy of the gonad. A similar effect is produced by completely removing the pituitary or administration of sex hormones. The ability of œstrone, progesterone, and testosterone to suppress the output of follicle-stimulating hormone was observed in adult male ring doves. Prolactin also produced an increase in body-wt. in adult male and female pigeons: this wt. increase was partly or entirely overcome by thyrotropic hormone. Large increases of liver-wt. were also induced by injections of 50 units of prolactin daily for 10 days. M. W. G.

Splanchnomegaly associated with action of prolactin. R. W. BATES, O. RIDDLE, E. L. LAHR, and J. P. SCHOOLEY (Amer. J. Physiol., 1937, **119**, 603—609).—The pronounced drop in body-wt. which immediately follows hypophysectomy is prevented by prolactin and the body-wt. can be restored to normal by prolactin after the full effects of hypophysectomy have become established. This effect of prolactin is maintained even after heating it for 5 hr. at 50°. The liver of the hypophysectomised pigeon is markedly enlarged by prolactin. Three weeks after hatching the young pigeon shows crop-gland stimulation from its own secreted prolactin and there occurs a remarkably rapid growth of the body with relative overgrowth of the liver, intestines, and probably the pancreas. Later, when growth has stopped, the administration of prolactin leads to a resumption of body growth and an overgrowth of the liver and intestines. Doubt is cast on the view that there is a single growth hormone in the pituitary. M. W. G.

Hypophysectomy and replacement therapy in relation to growth and secretory activity of the mammary gland. E. T. GOMEZ and C. W. TURNER (Missouri Agric. Exp. Sta. Res. Bull., 1937, No. 259, 72 pp.).—Growth of mammary gland parenchyma is not due to the synergistic action of pituitary and ovarian hormones but is directly controlled by a sp. hormone, the production of which occurs only after stimulation of the pituitary by ovarian hormones. Hypophysectomy of lactating guinea-pigs and cats caused drying-off in 2—3 days. Replacement therapy with pituitary extracts immediately after hypophysectomy or simultaneous injection of galactin, glucose, and adenotropic hormone prevented rapid cessation of lactation or re-established it if administered immediately after cessation. Replacement therapy with purified lactogenic hormone, galactin, and glucose or simultaneous injection of thyroxine, galactin, and glucose failed to produce these effects. A. G. P.

Gastro-intestinal movements and absorption in hypophyseal asthenia. B. A. HOUSSAY, V. G. FOGLIA, and O. FUSTINONI (Compt. rend. Soc. Biol., 1937, **126**, 627—628).—In hypophyseal asthenia in the toad after removal of the chromophil lobe the stomach and intestine are dilated and contractions are feeble. Absorption of sugar and fat takes place normally. D. T. B.

Influence of lactation on gonadotrope functions of the hypophysis. L. DESCLIN and C. GREGOIRE (Compt. rend. Soc. Biol., 1937, **126**, 250—252).—Immature ovaries grafted into suckling rats ovariectomised after parturition grow and become rich in lutein tissue; grafted into corresponding non-suckling rats they show atretic follicles. D. T. B.

Anti-hormones and substances antagonising hormones. P. FOÀ (Arch. Sci. biol., Napoli, 1937, **23**, 303—334).—A crit. review of the literature. R. S. C.

Anti-diuretic action of hypophyseal extracts and some alkaloids. K. D. SARGIN and B. E.

NUSSINBOIM (Arch. int. Pharmacodyn., 1937, **57**, 195—204).—In the mouse atropine (5 mg. per 20 g. body-wt.) has an anti-diuretic action. Eserine, scopolamine, strychnine, and harmine have no action. The effects of atropine are attributed to an action on the hypophysis. After thyroidectomy water diuresis occurs normally and is inhibited in the usual way by post-pituitary extracts. D. T. B.

Neurocrine function in hypophysis of toad. P. FLORENTIN (Compt. rend. Soc. Biol., 1937, **126**, 331—334).—The same relations between diencephalon and pituitary as described in fish are revealed for the toad by histological appearances. Keeping the toad in the dark stimulates activity in the pars intermedia. The colloid is carried to the cells in the preoptic nucleus which displays mitotic figures. D. T. B.

Vasoconstrictor pituitary secretion in the circulating blood of the toad. L. NEUBACH (Compt. rend. Soc. Biol., 1937, **126**, 623—624).—The blood and serum of normal toads contain a vasconstrictor substance absent from hypophysectomised animals. H. G. R.

Pituitary cardiac hypertrophy. J. WATRIN and R. FRANCOIS (Compt. rend. Soc. Biol., 1937, **126**, 357—358).—Post-hypophyseal extracts injected subcutaneously into guinea-pigs for 45—90 days produced ventricular hypertrophy. D. T. B.

Pituitary gland and the control of urinary excretion. E. C. DODDS, R. L. NOBLE, and P. C. WILLIAMS (J. Physiol., 1937, **91**, 202—211).—Transitory polyuria usually occurs in the rat following hypophysectomy; this is independent of whether anterior or posterior lobes are removed. In the rat posterior lobe removal results in a polyuria, which may be still present 140 days after operation, but this may occur even in the complete absence of the anterior lobe. The polyuria in rats differs in intensity, duration, and ease of production from that in cats. Permanent diabetes insipidus in a cat was permanently checked by hypophysectomy. A hormonal mechanism seems unlikely as a cause of the transitory polyuria, although it explains permanent diabetes insipidus; an inactive posterior lobe is necessary for the latter. A. C.

Posterior pituitary and muscle-creatine. B. G. SHAPIRO and H. ZWARENSTEIN (S. Afr. J. med. Sci., 1937, **2**, 15—17).—Injection of pituitrin causes a fall in muscle-creatine which is due to muscular absorption of water R. M. M. O.

Comparative physiology of the pituitary. M. BENAZZI (Arch. Sci. biol., Napoli, 1937, **23**, 1—13).—Transplants of pituitary of mouse, guinea-pig, and rabbit invariably cause œstrus within 4 days in immature female mice. Negative results were obtained with pituitary of pigeon and axolotl. R. S. CR.

Embryonal induction and induction substances. M. W. WOERDEMAN (Chem. Weekblad, 1937, **34**, 772—774).—An introduction to the subject. S. C.

Release of calcium in *Arbacia* eggs on fertilisation. D. MAZIA (J. Cell. Comp. Physiol., 1937, **10**, 291—304).—Fertilised and unfertilised eggs were frozen and broken up. The fragments and fluid were filtered through a collodion membrane which allowed the passage of inorg. Ca while retaining org. compounds. It was found that the "org." Ca decreased by 15% on fertilisation while the total Ca remained const. V. J. W.

Effect of temperature gradients on polarity in eggs of *Fucus furcatus*. E. W. LOWRANCE (J. Cell. Comp. Physiol., 1937, **10**, 321—337).—*Fucus* eggs embedded in agar were subjected to a temp. gradient varying from 0° to 1·9° per 75 μ. It was found that rhizoids originated on the warmed side of the eggs in all cases where the gradient lay between 0·6° and 0·8° per 75 μ. and was maintained for 24 hr. beginning 2 hr. after fertilisation. V. J. W.

Latent period of growth of embryonic and adult tissues *in vitro*. J. GOLDSCHMIDT, R. HOFFMAN, and L. DOLJANSKI (Compt. rend. Soc. Biol., 1937, **126**, 389—392).—The latent period of appearance of first new cells in adult tissues *in vitro* varies. It is less with diminution of age, but still appreciable for embryonic tissue. The heart of a 7-day chick embryo shows proliferation in 2—4 hr., that of the 20-day embryo in 6 hr., and of the one-year hen in 24 hr. D. T. B.

Anaërobic development of embryos. A. SPIRITO (Arch. Sci. biol., Napoli, 1937, **23**, 185—220).—The growth of embryos of *Petromyzon* and various amphibia was studied in the absence of O_2 or in solutions of CN′. In some species development was at once brought to a standstill, but in others it continued for a time. R. S. CR.

Centring of the nuclei in centrifuged eggs as a result of fertilisation and artificial membrane formation. A. R. MOORE (Protoplasma, 1937, **27**, 544—551).—Migration of the egg-nucleus and of the fusion-nucleus was studied in the centrifuged eggs of two echinoids, *Dendraster* and *Temnopleurus*. The evidence shows that the nucleus is not pushed but pulled by contractile structures in the cytoplasm. In eggs which have been drawn into flask shapes by centrifuging, if the sperm enters at the pole opposite that containing the egg-nucleus, the two nuclei do not meet, and subsequently only the part containing the sperm-nucleus shows segmentation. Eggs which have been caused to form membranes by chemical means require approx. twice the normal time for centring of the nucleus. V. B. W.

Uptake of substances and amœboid action. I. Visible amœboid motion in dying cells. H. GROSSFELD (Bull. Acad. Polonaise, 1937, **B** II, 1—5).—The small proportion of embryonic cells (fibroblasts) which survives treatment with 12% of urea in a 1 : 1 mixture of Ringer's solution and water forms small clumps which exhibit amœboid motions persisting for several hours. W. McC.

Action of sex hormones in the chick embryo. V. DANTCHAKOFF (Compt. rend. Soc. Biol., 1937, **126**, 177—180).—Folliculin, which produces sexual modifications in the embryo chick, is noxious for the guinea-pig; male hormone, which modifies sexual growth in the guinea-pig, is noxious for the chick. D. T. B.

Fate of female embryonic chicks treated with male hormone. V. DANTCHAKOFF (Compt. rend. Soc. Biol., 1937, **126**, 275—278).—The genetically female gonad of the embryo chick is not inverted by male hormone. D. T. B.

Experimental determination of time of chromosome doubling. K. MATHER (Proc. Roy. Soc., 1937, **B**, **124**, 97—106).—The time in the chromosome cycle at which splitting occurs is investigated, using the property of *X*-rays to cause chromosome breakage. Irradiation of split, or double, chromosomes produces chromatid breaks; irradiation of unsplit, or single, chromosomes produces chromosome breaks. The difference between these types of rearrangement is clearly seen at the subsequent metaphase. From application of this technique to pollen-grain mitoses in 3 plants, it is concluded that splitting occurs during the post-meiotic resting stage, *i.e.*, during the last resting stage before the mitosis observed. Genetical observations on *Drosophila* and *Zea* support the cytological results. The same conclusion is reached from considerations of chromosome pairing as from the *X*-ray experiments, *i.e.*, that the chromosomes split during the resting stage immediately prior to the mitosis at which separation occurs. It is considered that, in view of this evidence relating to the functional split, contradictory evidence relating to a visible split may be discounted. F. B. P.

Effect of *X*-rays on the first meiotic division in three species of Orthoptera. M. J. D. WHITE (Proc. Roy. Soc., 1937, **B**, **124**, 183—196).—Methods and details of irradiation of spermatocytes in three species of Orthoptera are described. Profound changes are thus produced in the chromosomes at the first meiotic division. The changes are not obvious until some hours after irradiation. Then (1) there is an alteration in the physical consistency of the chromosomes which tends to prevent their separation at anaphase; (2) this later leads to complete disintegration of the chromosomes. It is suggested that the phenomenon is quite distinct from ordinary chromosome "fragmentation" (as seen in inversions, translocations, etc.), and that it results from the destructive action of a substance produced or liberated in the cytoplasm as a result of irradiation. F. B. P.

Bisexual and co-operative properties of sex hormones in female rats. V. KORENCHEVSKY and K. HALL (J. Path. Bact., 1937, **45**, 681—708).—Injection of large doses of testosterone propionate into normal female rats produced a "gigantic" uterus and vagina with pregnancy changes in both organs. Testosterone produced only a slight hypertrophy of the organs with mucification of the vagina. From experiments on ovariectomised female rats the hormones may be classified into: (1) purely "male" or "female" (*e.g.*, progesterone, which affects the female sex organs only), (2) partly bisexual but (*a*) chiefly male (androsterone, testosterone propionate, androstanediol, and possibly Δ^4-androstenedione) (*b*) chiefly female (œstrone, œstradiol), (3) true bisexual hormones (*trans*-dehydroandrosterone, Δ^5-androstenediol, and testosterone). Most of the changes produced by hormones in the vagina and uterus resembled those of pregnancy, especially those produced by progesterone 1000 μg. combined with œstrone 1 μg. Small doses of œstrone and progesterone produced vaginal changes suggesting those of diœstrus in normal rats. If testosterone or testosterone propionate (with or without androstenedione) were added to progesterone and œstrone, a better general development of the uterus and vagina occurred, but the lace-like foldings of the uterine mucous membrane were not increased. Large doses of œstrone or œstradiol alone produced almost normal œstrous keratinisation of the vagina, but not œstrous changes in the uterus. C. E. B.

Experimental modification of the sexual cycle in trout by control of light. E. E. HOOVER (Science, 1937, **86**, 425—426).—By varying the amount of light to which brook and rainbow trout were exposed, spawning could be produced 3 months earlier than usual. C. A. K.

Androgenic endocrine activity in the female mammal. A. LIPSCHUTZ (Nature, 1937, **140**, 892).—Ovarian extracts possess androgenic activity. C. A. K.

Effect of testosterone propionate on a post-pubertal eunuch. G. L. FOSS (Lancet, 1937, **233**, 1307—1309).—A case of traumatic post-pubertal eunuchoidism of 19 years' duration in a man of 38 was treated with testosterone propionate. Sexual function and libido, previously almost absent, returned immediately, and after a few injections priapism, unrelieved by coitus, developed. 140 mg. of the propionate were given in daily injections for a week, followed by a weekly maintenance dose of 40 mg. Sexual activity persisted during 12 weeks' treatment and ceased on temporary withdrawal of injections. A slight growth of hair on the chest, a stronger growth of the beard, and an increase of 16 lb. in wt. also occurred. C. A. K.

Results of injecting testosterone into the seminal vesicles. A. LACASSAGNE and A. RAYNAUD (Compt. rend. Soc. Biol., 1937, **126**, 576—578, 579—581).—Testosterone injected into the vesiculæ seminales of young castrate rats produces epithelial modifications like those produced by subcutaneous injection. The chief feature chosen for estimating the intensity of the reaction is the height of the epithelial cells. 2·5 μg. of testosterone can thus be detected. D. T. B.

Effect of androgenic compounds on the histological structure of the pituitary in the castrated rat. M. ALLENSON (Proc. Roy. Soc., 1937, **B**, **124**, 196—209).—The power of 13 cryst. male hormone preps. to restore the pituitary of castrated adult rats to normal is described; hormones were given by daily injections in oil, in oil with the addition of palmitic acid, or by a single subcutaneous implantation of a solid tablet. 20 daily injections of androstenedione, testosterone, and testosterone propionate produced almost complete correction of the pituitary; the various compounds were not equally potent in reversing castration changes, and their activities are compared. Histological changes in the anterior pituitary during reversal of the castration changes

are described. There is little relation between œstrogenic properties of male hormones and their power to restore the pituitary. The pituitary response is correlated with the response of the accessory organs. Subcutaneous implantations of androstanediol and testosterone maintained the normal structure of the anterior pituitary for as long as 30 days.

F. B. P.

Multiple activities of androgenic compounds. R. DEANESLY and A. S. PARKES (Quart. J. Exp. Physiol., 1937, **26**, 393—402).—A review of the multiple activities of male hormones is given. *trans*-Androstenediol, dehydroandrosterone, androstenedione, and testosterone resemble œstrone in causing development of the uterus of the immature rabbit. The most active is the diol, which is 1/2000 as active as œstrone; it causes cornification of vaginal epithelium of the ovariectomised rat. Testosterone and its acetate and propionate cause mucification. Assayed on 20 ovariectomised mice, œstrone had 10,000 times the activity of androstenediol. Œstrone, testosterone and its propionate, and androstanediol prevent the development or cause the disappearance of the *X* zone in the adrenal cortex of castrated mice. Œstrone, testosterone, *trans*-dehydrandrosterone, and androstenedione but not androstanediol feminise the plumage of the Sebright capon. T. S. G. J.

Fate of transplants of prostrate and seminal vesicle in anterior chamber of eye. R. A. MOORE, H. B. ROSENBLUM, S. H. TOLINS, and R. H. MELCHIONNA (J. Exp. Med., 1937, **66**, 273—280).—A method of photographic measurement of prostatic implants in the anterior chamber of the eye in rabbits is described. Where implants are made in both eyes, a collateral increase or decrease in size is obtained under different conditions, suggesting a constitutional rather than a local cause of these changes.

A. C. F.

Relation of blood-cholesterol to size of prostatic and vesicular transplants in anterior chamber of eye. R. A. MOORE and J. J. SMITH (J. Exp. Med., 1937, **66**, 291—296).—The ingestion of cholesterol has no effect on the size of intra-optic prostatic implants in rabbits. A. C. F.

Intersexuality and adrenal virilism. H. BOSSELMANN (Endokrinol., 1937, **19**, 292—306).—A subject, 58 years of age, possessed ovaries, tubes, uterus, prostate, seminal vesicle, hypertrophied clitoris, male type of distribution of hair, and hypertrophic adrenal cortex. The adrenal cortex of both sides contained typical bone-marrow tissue. A. S.

Effect of testosterone on nipple of pregnant mice. H. BURROWS (J. Path. Bact., 1937, **45**, 311).—Painting pregnant mice with testosterone propionate dissolved in benzene did not prevent lactation, but prevented suckling owing to insufficient development of the nipples. C. E. B.

Hypophysis in castrated infantile male rats. H. GOLDHAMMER and L. KRAINER (Klin. Woch., 1937, **16**, 537—538).—Castration of infantile male rats (1—8 days old) produces changes in the hypophysis similar to but less marked than those observed in castrated older animals. F. W. L.

Reactions of uterine muscle and endometrium of rabbit to testosterone. J. M. ROBSON (Quart. J. Exp. Physiol., 1937, **26**, 355—359).—To investigate the inhibitory action of cryst. compounds with "male hormone" properties on the reactivity of the uterine muscle to the oxytocic hormone, the ovariectomised rabbit, injected daily with œstrin for 7—8 days, was injected for 4 days with a solution in oil of the compound and the reactivity of the uterus investigated on the next day by methods previously described. Testosterone inhibits the reaction of the rabbit's uterus to oxytocin *in vivo* and *in vitro*. It produces some endometrial proliferation. Progesterone produces inhibition only when marked proliferation is present. T. S. G. J.

Male sex hormones and corpus luteum formation. W. HOHLWEG (Klin. Woch., 1937, **16**, 586—587).—Infantile female rats (50 g. wt.) were employed. Androsterone, although it inhibits the formation of castration cells in both male and female rats, did not in daily doses of 15 mg. produce corpus luteum formation in females. With these amounts œstrus did not occur even after 8 days. Dehydroandrosterone (2—3 mg. daily) produced œstrus and luteinisation. Testosterone (5—10 mg. daily) produced luteinisation without œstrus. Thus testosterone which has a luteinising action is not œstrogenic, whilst œstrogenic substances have a luteinising action which is parallel with their œstrogenic action. F. W. L.

Effect of follicular hormone on the vitamin-*C* content of the adrenal glands and liver of the male guinea-pig. J. MOSONYI (Z. physiol. Chem., 1937, **250**, 132—138; cf. A., 1936, 1301).—In male guinea-pigs, the extent of reduction in the vitamin-*C* contents of the adrenals and liver produced by injection of the hormone is not affected by castration and/or thyroidectomy. Hence the action of the hormone is direct. W. McC.

Œstrogenic substances and cholesterol in the serum of pregnant mares. O. MÜHLBOCK (Z. physiol. Chem., 1937, **250**, 139—146).—The blood of mares contains 250—1000 international units of œstrogenic substances per 100 c.c. in the 6th—9th months of pregnancy. In the 10th—11th months, the val. is up to 40. The corresponding val. for blood of non-pregnant mares is 12·5 units. Almost the whole of the blood-œstrogenic substance is in the serum, in which it occurs chiefly in a form sol. in org. solvents only after hydrolysis. The serum-cholesterol of pregnant mares (6th—9th months) is 0·073—0·124%. (73—82% esterified) whilst that of non-pregnant mares is 0·064—0·103% (70—85% esterified).

W. McC.

Simultaneous administration of œstrin and progestin in the male macacus rhesus. P. DE FREMERY (Acta. brev. neerl. Physiol., 1937, **7**, 9—10).—Prolactin injections in the monkey after percutaneous œstriol produced only a few drops of milky fluid, nor was a better effect produced by prolactin after œstriol and progestin on alternate days, and there was a complete absence of scrotal swelling.

T. F. D.

Paradoxial menformon action and vitamin-*A* lack. P. ARONS (Acta. brev. neerl. Physiol., 1937,

7, 1—2).—Examination of the sex organs of castrated and uncastrated vitamin-*A*-deficient rats leads to the conclusion that the testes produced more menformon when the diet is deficient in -*A*.

T. F. D.

Accessory fibrous bodies of the ovary. J. WALLART and S. SCHEIDEGGER (Bull. Histol. Tech. micr., 1937, **14**, 162—164).—Ovaries at the menopause and later contain fibrous bodies similar to those derived from corpora lutea but lacking their peripheral network of blood vessels. These are formed in the cortical part of the ovary by deposition of an acidophil amorphous substance between the ordinary cortical cells. These bodies are probably compensatory and often appear in the neighbourhood of true fibrous masses from corpora lutea.

E. E. H.

Hypertrophy, regeneration, and retardation of ovarian weights in growing rats after œstrone injections. F. E. EMERY (Quart. J. Exp. Physiol., 1937, **27**, 17—26).—The effect of œstrone on the œstrous cycles of rats, intact and after removal of one ovary or the halves of both ovaries, was investigated. Despite injection of 1—20 rat units daily for 6 weeks, normal hypertrophy of the remaining ovary, regeneration of the ovarian fragments, and no reduction in ovarian wts. ensued. The length of the œstrous cycle was not affected. T. S. G. J.

Treatment of pre-eclampsia with progesterone. G. B. MARSDEN (Brit. Med. J., 1937, II, 1221—1222).—Progesterone was given to 8 patients with pre-eclamptic symptoms. None developed fits, but in only 3 was there an appreciable fall of blood pressure.

C. A. K.

Presence of a lactogenic substance in the urine of lactating women. J. LIARD (Compt. rend. Soc. Biol., 1937, **126**, 512—514).—A lactogenic substance ("urolactin") has been obtained from the urine of lactating women using Gostimirovic's method for the gonadotropic hormones. H. G. R.

Clinical method for determination of folliculin using prepubertal mice. A. DURUPT (Compt. rend. Soc. Biol., 1937, **126**, 382—384).—The method of Doisy and Curtiss involving the opening of the vagina of prepubertal mice is recommended particularly for aq. solutions. A method for the isolation of folliculin from urine for clinical determinations is described.

H. G. R.

Influence of progesterone and testosterone on mammary adenosarcoma. A. LACASSAGNE (Compt. rend. Soc. Biol., 1937, **126**, 385—387).—Mammary adenosarcoma provoked in male mice by œstrone, or spontaneously occurring in females, was not influenced by treatment with testosterone.

D. T. B.

Anterior pituitary hormone and duration of pregnancy. A. SPRENG (Endokrinol., 1937, **19**, 161—164).—The author cannot confirm that injections of anterior pituitary hormone in rabbits and rats increase regularly the duration of pregnancy.

A. S.

Antuitrin *S* intradermal pregnancy test. A. M. GILL and J. HOWKINS (Brit. Med. J., 1937, II, 1069).—The antuitrin *S* intradermal pregnancy test was found to be valueless on trial in 147 subjects (49 male, 98 female). 51 out of 73 pregnant women gave a positive (*i.e.*, non-pregnant) response. C. A. K.

Effect of œstrone on secretion of gonadotropic complex in parabiotic rats. R. K. MEYER and R. HERTZ (Amer. J. Physiol., 1937, **120**, 232—237).—The effect of œstrone was determined quantitatively on the amount of gonadotropic secretion of castrated male and female rats in parabiosis with normal females. Cryst. œstrone (0·5—5 μg. daily) (m.p. 252°) was administered subcutaneously in 0·01 c.c. of maize oil per day. Injections were always begun within a few hrs. after the removal of the gonads. Administration of small doses of œstrone to the castrated partner completely inhibited the ovarian hypertrophy usually observed in the normal partner, and the degree of ovarian response increased as the dose was reduced. Larger doses were required for inhibition in castrated male–female than in castrated female–female pairs. The amount of ovarian hypertrophy obtained is probably a measure of the quantity of gonadotropic complex actually secreted by the pituitary into the blood stream. M. W. G.

Œstrogenic activity of some hydrocarbon derivatives of ethylene. E. C. DODDS, M. E. H. FITZGERALD, and W. LAWSON (Nature, 1937, **140**, 772).—Activities of various derivatives are tabulated (cf. A., 1937, III, 229). L. S. T.

Action of female sex hormone on ovipositor of bitterling. W. FLEISCHMANN and S. KANN (Pflüger's Archiv, 1937, **238**, 711—712).—The addition of urine increases the effectiveness of pure œstradiol in producing growth of the ovipositor. J. M. R.

Bioassay of progestin. J. PINCUS and N. T. WERTHESSEN (Amer. J. Physiol., 1937, **120**, 100—104).—Rabbit does ovariectomised 18—20 hr. after mating were injected subcutaneously with progesterone twice daily on the 2nd, 3rd, and 4th days after copulation. They were killed on the 5th day and the uterus was flushed out for ova, and a section of the uterus preserved for study of the endometrium. The diameter of the ovum exclusive of the albumin coating, the mean ovum diameter per individual, and the ratio of glandular to stromal tissue in the uterine mucosa were determined. A mean ovum diameter of 479 μ. or greater in a single test animal indicated the presence of active progestin; a val. of 0·3227 or greater for the ratio of glandular area (G) to total mucosa area (M) and a val. of 49·3 or greater for the combined index were similarly significant. In a single test animal a dosage of 0·78 mg. of progesterone could almost always be detected by ovum diameter measurement; similarly the G/M ratio permitted the detection of 0·45 mg. and the combined index a dosage of 0·38 mg. of progesterone.

M. W. G.

Non-occurrence of cystine in herring's roe. C. T. MÖRNER (Z. physiol. Chem., 1937, **250**, 25—30).—The fresh roe yields 0·01—0·02% of taurine, equiv. to approx. 30% of the total taurine content when treated by the procedure of Steudel and Takahashi (A., 1924, i, 116) but no cystine, taurine being the only S compound present. W. McC.

Interrelation of pituitary, thymus, and ovary. C. MÜLLER (Endokrinol., 1937, **19**, 289—292).—The min. dose of follicle hormone to produce œstrus was determined in castrated female rabbits. The threshold dose remained unchanged after extirpation of the thymus gland. Following extirpation of the pituitary ten times the original amount of follicle hormone was required to produce œstrus. A. S.

Effect of di-iodotyrosine on lactation. P. GRUMBRECHT and G. VON DÜSTERLHO (Klin. Woch., 1937, **16**, 513—516).—Pregnant guinea-pigs were grouped and treated as follows: (1) controls; (2) injected intraperitoneally, after parturition, with 0·01 g. of thyrotropic hormone for three days; (3) received 0·25 mg. of di-iodotyrosine *per os*; (4) first injected with 0·01 g. of thyrotropic hormone for five days and then received 0·25 mg. of di-iodotyrosine daily. The milk production was measured at regular intervals and histological examination was made of the mammary glands. The time curves of milk production showed on comparison with the normal that the flow of milk was diminished and gradually brought to a premature end by the thyrotropic hormone. This artificial depression could be overcome by the administration of di-iodotyrosine and a transitory increase brought on, but the daily secretion still remained less in amount than the normal. F. W. L.

Does progesterone cause delayed parturition? F. BOE (Klin. Woch., 1937, **16**, 610).—Rats, 3—4 months old and in their first pregnancy, were given gonadotropic hormone, œstrin, or progesterone. 30—100 units of gonadotropic hormone daily delayed parturition in 17 out of 18 animals until after the 23rd day. With the larger doses the fœtus was underdeveloped. A somewhat more marked under-development occurred with œstrin, which also delayed parturition. Synthetic proluton (0·5—1·0 mg. daily) did not influence pregnancy or fœtal development. F. W. L.

Effect of hysterectomy on mammary gland development in the rabbit. J. L. GILLARD (Amer. J. Physiol., 1937, **120**, 300—303).—Mammary gland development in hysterectomised and non-hysterectomised rabbits was studied, the method of approach being total amounts of the mammary gland on biopsy. Hysterectomy delayed degeneration of the corpus luteum, prolonged pseudopregnancy and caused a hyperæmic condition of the mammary gland, but had no effect on the gland architecture itself. Prolonged treatment with œstrin in an öophorectomised virgin rabbit produced duct development only. M. W. G.

Effects of nursing on mammary gland tumour incidence in mice. J. J. BITTNER (Amer. J. Clin. Path., 1937, **7**, 430—435).—The foster-nursing of mice from a stock having a high incidence of breast tumours by females from stock having a low incidence reduced materially the incidence of breast tumours in both the fostered animals and their progeny. C. J. C. B.

Cyclical changes in the vaginal smear of the baboon and its relationship to the perineal swelling. J. GILLMAN (S. Afr. J. med. Sci., 1937, **2**, 44—56).—The perineum of the baboon passes through a rhythm of turgescence and deturgescence corresponding exactly with the rhythm of the vaginal smear. The menstrual phase occupies the middle of a period of perineal rest; the vagina post-menstrual phase corresponds with the remainder of this and the beginning of a turgescence phase, the remainder of which coincides with the copulative phase. The proliferative phase fills two thirds of the perineal deturgescence, the last third of which, together with the first half of the perineal rest, fill the premenstrual phase. R. M. M. O.

Menstrual cycle of baboon (*Papio porcarius*). J. GILLMAN (S. Afr. J. med. Sci., 1937, **2**, 156—166).—Disturbance of the menstrual cycle occurred in 3 baboons following laparotomy and manipulation of the ovaries near the middle of the menstrual cycle. The effect resembled that obtained in the human female, except that no menstruation occurred at the end of the immediate reaction. Unilateral ovariectomy in a young baboon altered its irregular cycles to normal adult type of rythm. Hysterectomy did not permanently effect the perineal rhythm. Immature baboons readily responded to œstrone injections by alterations in the perineum and vaginal smear. Premature puberty was also initiated in two animals after a latent period of several months. A remote action of œstrone is suggested, probably on the pituitary, which in young animals responds by initiating and maintaining the regular menstrual rhythm. The danger of provoking this action in young children under œstrone therapy is indicated. R. L. N.

Relation of cyclic changes in human vaginal smears to body temperatures and basal metabolic rates. B. B. RUBENSTEIN (Amer. J. Physiol., 1937, **119**, 635—641).—The subjects were normal women (21—39 years old) without pelvic abnormality. While the various phases of the cycle blend into each other, the typical smears, premenstrual, menstrual, post-menstrual, and pre-ovulative or "copulative," can be clearly defined. A const. relation between the lowest body temp. of the mouth and the characteristic ovulative smear was found, and of the highest temp. with the characteristic pre-menstrual smear. The basal metabolism was found to be independent of body temp. M. W. G.

Flavin content of fœtal organs (liver, placenta). W. NEUWEILER (Z. physiol. Chem., 1937, **249**, 225—230).—A method of extracting flavin from biological material is described. Fœtal liver contains 0·6—12·6 μg. (usually 4—8 μg.) and placenta 0·7—5·4 μg. (usually 1—3 μg.) of flavin (calc. as lactoflavin) per g. The proportions of combined flavin are 51·5—87% and 35—53·6%, respectively. W. McC.

Influence of dietary fat on the phosphatide-fatty acids of the fœtus. K. MIURA (J. Biochem. Japan, 1937, **25**, 579—593).—In pregnant rats, the nature of the fatty acids of fats and phosphatides is the same in mother and fœtus. F. O. H.

Evolution and adaptation in the digestive system of the Metazoa. C. M. YONGE (Biol. Rev., 1937, **12**, 87—115).

Carotenoids and chlorophyll in the digestion of ruminants. F. ROGOZIŃSKI (Bull. Acad. Polonaise, 1937, **B** II, 183—193).—Carotenoids ingested by sheep are mainly excreted in the fæces (recovery of carotene and xanthophyll 70 and 80%, respectively). Chlorophyll, however, is decomposed to an extent (78—88%) dependent on the diet, due to the action of acids in the chyme. F. O. H.

Morphology of the alimentary canal, process of feeding, and physiology of digestion of the nudibranch mollusc *Jorunna tomentosa* (Cuvier). N. MILLOTT (Phil. Trans., 1937, **B**, **228**, 173—217).—Digestion is wholly intracellular and confined to digestive diverticula. Enzymes found were two proteases, one acting in acid, the other in alkaline, medium, and a lipase. An amylase is possibly present. A. D. H.

Secretion and composition of parotid saliva in buffaloes. G. K. SHARMA (Indian J. Vet. Sci., 1936, **6**, 266—269).—Sight of food produces slight salivary secretion in comparison with that produced during mastication. The copiousness of the secretion is related to the consistency of the food. Pilocarpine and arecoline stimulate secretion, pilocarpine being antagonised by atropine. The p_H of the saliva was 8·8, and mucin and ptyalin were absent. R. M. M. O.

Urea and chlorides in human parotid saliva. R. G. BRAMKAMP (J. Lab. clin. Med., 1937, **22**, 677—680).—Atropine and pilocarpine alter the concn. of Cl′ in human parotid saliva only in proportion to the change in rate produced, there being a progressive increase of [Cl′] with increased rate of secretion. These two drugs cause little change in the urea concn. of the saliva; rate of secretion has little effect. It is inferred that urea may be passed through by some process of filtration, whereas Cl′ is secreted through the activity of gland cells. T. H. H.

Effect of histamine on salivary secretion. O. S. GIBBS and H. H. MCCLANAHAN (J. Pharm. Exp. Ther., 1937, **61**, 218—229).—In cats, histamine injected into the blood supplying the salivary gland only occasionally causes secretion, the effect being abolished by atropine but stimulated by eserine. Acetylcholine, administered in the same way as histamine, causes secretion which, as with histamine, persists as long as administration continues. Histamine increases the effects of stimulation of the chorda tympani but not those produced by acetylcholine. Probably histamine acts by prolonging the action of the mechanism which produces acetylcholine or by damaging the mechanism which checks acetylcholine production. W. McC.

Changes in the submaxillary secretory response to pilocarpine after section of the chorda tympani. F. R. PIERCE and M. I. GREGERSEN (Amer. J. Physiol., 1937, **120**, 246—256).—The tests were carried out on the unanæsthetised dog. Bilateral submaxillary fistulæ were established following the technique of Babkin. Salivary secretion was elicited by the intravenous injection of 0·9% NaCl solution containing 0·2 mg. of pilocarpine per c.c. at a const. rate for 20 min. The rate of secretion was observed for 30 min. In each animal one submaxillary gland was deprived of its parasympathetic supply, the other serving as a control. After section of the chorda tympani, the gland responded more readily to pilocarpine, and secretion appeared more promptly and in greater amounts than from the normal control gland. This effect appeared within 6 days, developed fully in 2—3 weeks, and was undiminished a year after denervation. This increased response to pilocarpine was not due to a sudden release of preformed salivary substances or to a more abundant blood flow through the gland. It was not the result of sensitisation of the parasympathetic nerve endings since no increased response could be demonstrated to either acetylcholine or acetyl-β-methylcholine. Paralysis of the parasympathetic nerve endings by quinine did not abolish the characteristic difference between the responses of the normal and denervated glands to pilocarpine. M. W. G.

Salivary secretion test in peptic ulcer patients and normal subjects. H. NECHELES and P. LEVITSKY (J. Lab. clin. Med., 1937, **22**, 624—626).—The salivary response to pilocarpine was determined in a group of 30 normal persons and 34 ulcer patients. The salivary secretion of the ulcer group was significantly lower than that of the normal control group. There was no relation between vol. of secretion and age in either group. T. H. H.

Gastric acid during recurrences and remissions of duodenal ulcer. C. F. G. BROWN and R. E. DOLKART (Arch. Int. Med., 1937, **60**, 680—693).—In the same patient prior to a recurrence of activity of an ulcer the level of free acid may rise, fall, or undergo no significant change. There is no const. variation during the recurrence. The height of the level of free acid bears no relation to the degree of distress manifested by the patient. T. H. H.

Influence of tryptophan on lesions of stomach. O. FUERTH and R. SCHOLL (Mitt. Grenzgeb. Med. Chir., 1937, **44**, 631—641).—Artificially produced lesions of the mucous membrane of the stomach in dogs heal more quickly after injections of tryptophan. A. S.

Antagonistic action of morphine and atropine on the human stomach. H. O. VEACH (J. Pharm. Exp. Ther., 1937, **61**, 230—239).—In man, morphine injected intravenously has a predominantly motor action on the stomach whilst atropine inhibits gastric motility, both drugs being mutually antagonistic in their action. W. McC.

Gastric secretion in ruminants. D. L. ESPE and C. Y. CANNON (Amer. J. Physiol., 1937, **119**, 720—723).—Three calves with Pavlov pouches were used in the study of psychic secretion. The psychic phase of gastric secretion is relatively unimportant in the calf. Teasing with food and sham feeding where œsophagostomies had been performed were equally ineffective. The reason for the rather minor fluctuations in rate of gastric secretion as compared with animals like the dog may be due to the more continous type of gastric secretion in ruminants. M. W. G.

Difference in potential across gastric membranes and certain factors modifying the

potential. J. P. QUIGLEY, J. BARCROFT, G. S. ADAIR, and E. N. GOODMAN (Amer. J. Physiol., 1937, **119**, 763—767).—Two trained unanæsthetised dogs provided with Pavlov pouches were examined by the method of Adair and Goodman in 64 experiments. The measurements of the potentials were made with the 3·5M-KCl–HgCl electrodes connected with the tissue studied by means of rubber tubes containing agar–KCl or a string soaked in KCl. Measurements of the skin–stomach potential were made by completing the circuit in turn between the stomach or pouch with a third electrode applied to an area of freshly abrased skin. The stomach–pouch potential was also determined. The electrical state within the lumen of the stomach or a gastric Pavlov pouch during fasting periods was relatively const. The potentials of two portions of gastric tissue usually differed in magnitude, in time, and in extent of change, but generally change in the same direction. The results indicated that gastric potential is not dependent on the p_H of gastric contents, secretion of acid, pepsin, or mucin, on hunger contraction, digestive contraction, or on the diffusion of ions or non-electrolytes. The electric potential is lowered by contact of milk, emulsified fats, alcohol, or glucose with the gastric mucosal surface, but in the case of the last two, not by their introduction into the blood stream. M. W. G.

Fractional gastric analysis in the South African Bantu. H. D. BARNES and M. S. GORDON (S. Afr. J. med. Sci., 1937, **2**, 75—81).—The acid response to an oatmeal gruel test meal is less than in Europeans. Attention is directed to the importance of an irregular appearance of starch in a series of samples as an indication of an unsatisfactory experiment in which the tip of the tube has not remained uniformly in the stomach. R. M. M. O.

Effect of physiological hypersecretion on the gastro-duodenal mucosa. C. R. SCHMIDT and S. J. FOGELSON (Amer. J. Physiol., 1937, **120**, 87—90).—Œsophagostomy was performed in 10 healthy dogs, without injury to the vagi. The dogs were sham fed thrice daily for periods of 30—45 min. In the evening their daily ration was fed by stomach tube. Experiments were also carried out to augment the acid irritation of the gastro-duodenal mucosa by introducing 300 c.c. of 0·36% HCl into the stomach after the morning and noon sham feedings. Acid irritation was present for 10—12 hr. daily over a period of 20—102 days. At autopsy the gastric mucosa showed no changes and the duodenum only minor degrees of duodenitis. M. W. G.

Relation of anæmia of chronic glomerulonephritis to gastric acidity. S. R. TOWNSEND, E. MASSIE, and R. H. LYONS (Amer. J. med. Sci., 1937, **194**, 636—645).—Examination of the blood of 48 cases of chronic glomerulonephritis showed that 43·5% had a normocytic anæmia, which became apparent when renal insufficiency occurred, and increased with the degree of nitrogen retention. When the anæmia increased there was a lowering in gastric acidity; abs. achlorhydria was present when the CO_2 content of whole blood fell below 30 vols.-%. Bone-marrow sections showed no evidence of aplasia. R. L. N.

Nervous control of pancreatic secretion in the dog. P. J. CRITTENDEN and A. C. IVY (Amer. J. Physiol., 1937, **119**, 724—733).—In the "chronic" enterectomised dog (with no absorption of secretin or intestinal secretagogues) there is a continuous secretion of pancreatic juice (0·2—0·9 c.c. per hr.). Intravenous injection of normal saline or 6% glucose has no effect; sham feeding produces a small effect. Acetylcholine (0·075—0·1 mg. per kg. intravenously slowly) doubles the secretion during the next 15 min.; eserine (0·06—1 mg. per kg.) may produce a greater effect, but does not potentiate the action of subsequently injected acetylcholine. Stimulation of the peripheral end of the vagus nerve 3—6 days after section does not inhibit the heart, but increases pancreatic secretion; if the nerve is stimulated after the injection of secretion a greater effect is obtained. Stimulation of the peripheral end of the freshly divided vagus inhibits the secretory response to secretin (confirmatory of Aurep). M. W. G.

Effect of insulin administration on the response of the pancreas to parasympathetic stimulation. C. O. HEBB (Quart. J. Exp. Physiol., 1937, **26**, 339—354).—Electrical stimulation of the vagi of rabbits increases the vol. and lipase concn. of the pancreatic secretion. Administration of insulin diminishes or reverses this effect. This is not due to exhaustion of the acinous cells, since the effects of insulin are antagonised by the injection of glucose, pilocarpine, or acetylcholine. During insulin hypoglycæmia, with intact vagi, the output of lipase diminishes but if the vagi are cut, the output is const. Injection of glucose enhances the normal secretory effect of vagal stimulation. Mechanical changes such as constriction of the ducts or blood vessels of the pancreas do not account for the inhibitory effect of insulin. T. S. G. J.

Histological modifications of pancreas after prolonged injection of secretin. J. NETIK (Bull. Histol. Tech. micr., 1937, **14**, 149—161).—Six types of cell are distinguished in the pancreas (dog); any one acinus is classified according to the preponderant cell type, the cells differing chiefly in the arrangement of their granules and mitochondria. At rest the essential characteristic of the microscopical appearance is homogeneity, the majority of cells being filled with granules. When stimulated to active secretion by secretin there is vasodilatation, and diminution in the number of granules, but some of the acini still present a resting appearance. Thus while some of the acini are actively working others are regenerating their secretory potentiality. E. E. H.

Pancreatic secretion after secretin during insulin hypoglycæmia and after graded amounts of secretin. H. LAGERLÖF and G. WELIN (Acta med. scand., 1937, **91**, 397—408).—The pancreatic secretion was investigated in man after secretin injection and also after secretin injection during the progress of insulin hypoglycæmia. This combination did not markedly affect the vol. of the secretion or the amount of bicarbonate (cf. simple insulin stimulation), but the enzyme secretion was much increased and might be 100—200% more than the added effect of the stimulants given separately. When graded doses of

secretin were given alone ($\frac{1}{8}$, $\frac{1}{4}$, and $\frac{1}{2}$ of the usual dose) the vols. and bicarbonate varied with dose up to the $\frac{1}{2}$ dosage, whereas the diastase and trypsin secretions were independent of dosage. When these experiments were combined with insulin hypoglycæmia, the vols. and bicarbonate characteristic of the insulin secretions reappeared, and a marked increase of enzymes was again found. C. A. A.

External pancreatic secretion and discharge of bile during hypoglycæmia following intravenous administration of insulin. A. R. FRISK and G. WELIN (Acta med. scand., 1937, **91**, 170—182).—The secretion of pancreatic juice and the discharge of bile following injection of insulin were studied in 15 subjects (normal, gastric hyper- and hypo-secretion, achylia), using the double gastro-duodenal tube. In 12 cases there was a slight increase in the duodenal contents above the control period, and a slight increase in the [HCO_3']. In all cases there was a discharge of bile (contrary to what occurs after secretin); there was also an increase of diastase concn. like that obtained after secretin. This pancreatic response is not due to stimulation of secretin liberation by acid from the stomach since (*a*) the acid is continually aspirated away, (*b*) histamine stimulation of gastric juice led to drying up of the duodenum, and (*c*) it occurs in achylia. These findings are discussed and are considered to support a dual theory of pancreatic secretion. C. A. A.

Composition of the secretion of the anal gland of the dog. J. BRÜGGEMANN and H. RATHSFELD (Z. physiol. Chem., 1937, **250**, 123—131).—The average amount of secretion (water approx. 88%) in a single gland is approx. 2 g. The dried material contains 96% of org. matter cholesterol 2%, fat (I val. 52, sap. val. 274) 13·2%, low content of P] and 4% of inorg. matter (P 11·2%). W. McC.

Automatism of the snail's intestine. M. BEAUVALLET (Compt. rend. Soc. Biol., 1937, **125**, 959—961).—Naturally healing snail's intestine suspended in eserinised fluid liberates acetylcholine. D. T. B.

Permeability of frog liver to certain lipin-insoluble substances. C. HAYWOOD and R. HÖBER (J. Cell. Comp. Physiol., 1937, **10**, 305—319).—When the liver of the frog was perfused from the anterior abdominal vein with Ringer's solution containing the lipin-insol. dye eriocyanin, the bile contained up to 180 times as much dye (determined colorimetrically) as the perfusion fluid. Similar experiments with other lipin-insol. substances, including xylose, lactose, insulin, and Mg, showed no such secretory concn. V. J. W.

Oxygen supply of liver. J. MCMICHAEL (Quart. J. Exp. Physiol., 1937, **27**, 73—87).—The livers of rabbits and cats were examined histologically after ligature of the hepatic artery and portal vein and denervation. Acute experiments, under anæsthesia, designed to study the O_2 metabolism and blood supply of the liver, were also carried out. In cats, 20% of the blood supply and 63% of the O_2 supply of the liver comes from the portal vein. Hepatic vein blood always contains less O_2 than portal vein blood. A linear correlation exists between O_2 saturation of the portal vein blood and blood pressure. Correlation between (O_2 in portal vein blood − O_2 in hepatic vein blood) (D) and portal vein pressure is curved, *i.e.*, the increase in D for unit increase of portal vein pressure falls with increase in the latter. With a fall in blood pressure due to hæmorrhage and shock, the O_2 content of the portal vein is proportionately diminished and the liver becomes more dependent on the hepatic artery. Ligature of the portal vein of cats produces fatty degeneration followed by complete atrophy of the central lobules supplied by the vein, similar to the "nutmeg liver" of cardiac failure. Obstruction of the hepatic artery of the rabbit produces an 18% diminution of flow, and constriction of the hepatic nerve also, a 50% diminution by causing vaso-constriction of the portal venules within the liver. This effect, however, is so transient that it does not play any significant part in determining the liver degeneration which results from occlusion of the hepatic artery. T. S. G. J.

Effect of anoxia on liver. L. CHEVILLARD, F. HAMON, and A. MAYER (Ann. Physiol. Physiochim. biol., 1937, **13**, 634—641).—White mice kept at low O_2 tension have fatty accumulations in the liver, but this may be attributable to fasting, as the animals lose appetite. D. T. B.

Diphtheritic toxæmia and carbohydrate synthesis in liver. M. C. A. CROSS and E. HOLMES (Brit. J. exp. Path., 1937, **18**, 370—390).—The ability of slices of rabbit's liver, *in vitro*, to form carbohydrate, and the increased effect produced by the addition of various substrates, were measured. Insulin inhibits gluconeogenesis. Slight glycogen synthesis *in vitro* was demonstrated. Adrenaline reduces glycogen synthesis from lactate and glucose to about the same extent. Livers from rabbits injected with diphtheria toxin were similarly studied. As the time after the injection increases a progressive decrease in the ability of the liver to synthesise carbohydrate was found; the effect of various substrates was also decreased, but not uniformly. Toxæmic livers show a diminished power to remove lactate, and the power of insulin to inhibit gluconeogenesis is abolished. Glycogen synthesis is abolished prior to the failure to form carbohydrate except when the glucose concn. is very high. Pyruvic acid added to normal liver slices increases the O_2 consumption and R.Q.; it is tentatively concluded that it is partly burned and partly synthesised to carbohydrate. In toxæmia both these processes are diminished, but other substrates besides pyruvic acid are metabolised. R. L. N.

Response of the liver to the oral administration of glucose. I. S. CHERRY and L. A. CRANDALL, jun. (Amer. J. Physiol., 1937, **120**, 52—58).—Unanæsthetised normal dogs were used and cannulæ fixed in the portal and hepatic veins (two-stage technique of London). In each experiment portal, hepatic, and systemic venous samples and a sample from the femoral artery were removed after a 12—18 hr. fast. Glucose was then given by stomach tube, and similar blood samples were removed 30—90 min. later. In the fasting animal the liver added glucose (8 mg. per 100 c.c.) to the blood and removed or did not change lactic acid. The skeletal muscles and

gastro-intestinal tract removed or did not change glucose and added or did not change lactic acid. After oral administration of glucose the portal venous blood contained up to 40 mg. more of this substance than arterial blood and up to 29 mg. per 100 c.c. were removed by the liver. After oral glucose the amount of lactic acid removed by the liver decreased, and in most instances this organ added lactic acid to the blood. Administration of glucose by mouth has no apparent effect on the addition of lactic acid or removal of glucose by the skeletal muscles or the intestinal tract. It was suggested that in the presence of an excess of glucose the process of gluconeogenesis from lactic acid may cease, and the lactic acid formed by the liver itself escape into the blood. M. W. G.

Influence of pancreas extracts ("fat-metabolising hormone") on fat deposition in liver. E. M. MacKay (Amer. J. Physiol., 1937, **119**, 783—786).—Rats develop fatty livers on low-protein high-fat diets (glucose 45, butter fat 40, casein 5, dried powdered medicinal brewers' yeast 5, and the usual salt mixture 5). The pancreas extract (prepared by Dragstedt's method) was used in aq. solution; it contained 20% of total solids and 2·42% N. More fat is deposited in the liver of female or young rats. Oral administration of the extract caused a rapid disappearance of fat stored in the livers in fasting rats, and a reduction in the amount of fat in rats kept on the diet. The results offer easily used and more uniform test animals for fractionation and standardisation of pancreatic extracts influencing the liver fat. M. W. G.

Liver-fat in fasting homœotherms. L. Chevillard, F. Hamon, and A. Mayer (Ann. Physiol. Physiochim. biol., 1937, **13**, 539—553).—Fixed fatty acids accumulate during fasting in the liver of the mouse, rat, guinea-pig, and rabbit; this is independent of the nature of the food previously given. D. T. B.

Changes in liver of fasting rabbit. S. Lazard-Kolodny and A. Mayer (Ann. Physiol. Physiochim. Biol., 1937, **13**, 554—570).—In fasting rabbits the wt. of the liver is, proportionally to the body-wt., below normal. D. T. B.

Alterations in serum-protein as index of hepatic failure. E. F. Foley, R. W. Keeton, A. B. Kendrick, and D. Darling (Arch. Int. Med., 1937, **60**, 64—76).—The low val. for serum-albumin, with elevation of the globulin content, found in decompensated portal cirrhosis is not due to mechanical loss in ascitic fluid or restriction of the intake of protein. The alterations in the protein are attributed to hepatic damage and to the loss of ability of the liver to synthesise serum-albumin. T. H. H.

Blood-cholesterol and -cholesteryl esters in liver disease. K. Kusui (J. Biochem. Japan, 1937, **25**, 461—485).—The cholesteryl ester content of human blood, normally 37·5—47·9% of the total cholesterol (normally 0·128—0·163%), is decreased in hepatic diseases with damaged parenchyma independently of normal or low vals. of cholesterol. When cholesterol is high (*e.g.*, nephritis) or low (*e.g.*, anæmia), the ratio cholesteryl ester : cholesterol is not diminished. Blood-cholesterol in dogs varies daily by 10% whilst the ratio remains const. With tolylenediamine-poisoned dogs, the ester decreases and cholesterol increases, whilst ligature of the bile ducts is followed by parallel increases in both vals. F. O. H.

Phosphatase activity, inorganic phosphorus, and calcium of serum in disease of liver and biliary tract. C. A. Flood, E. B. Gutman, and A. B. Gutman (Arch. Int. Med., 1937, **59**, 981—999).—The phosphatase activity of serum was increased in every case of jaundice due to obstruction of the common bile duct, the vals. exceeding 10 Bodansky units per 100 c.c. in 23 of 25 cases investigated. The phosphatase activity of the serum was elevated irrespective of the degree or duration of jaundice and whether obstruction was complete or incomplete. The inorg. P and Ca contents of the serum were within normal limits in most cases. T. H. H.

Hippuric acid elimination as a test for liver function. K. Yardumian and P. J. Rosenthal (J. Lab. clin. Med., 1937, **22**, 1046—1053).—From hippuric acid elimination tests in 100 clinical cases including damaged liver, cholecystitis, and cardio-renal diseases it was concluded that the chief val. of the test was to differentiate intrahepatic and extrahepatic jaundice. In liver damage the elimination is very low, whilst in acute obstruction it is normal. In chronic obstruction with liver damage the test is valueless. The test has no val. in cases of advanced cardiac decompensation, since as a result of passive congestion of the liver the elimination is very low, nor in advanced kidney diseases since there is scarcely any elimination of hippuric acid. T. H. H.

Insulin hypoglycæmia as test of liver function. E. Aubertin and R. de Lachard (Compt. rend. Soc. Biol., 1937, **126**, 505—509).—In certain diseases of the liver the fall of blood-sugar produced by an injection of insulin develops and recovers more slowly than in normal subjects. D. T. B.

Colour reaction applied to liver extracts. G. E. Shaw (Quart. J. Pharm., 1937, **10**, 380—386).—Certain constituents of liver and other tissues give a blue colour response to Folin's reagent (A., 1933, 845). The chromogen consists of two types, one pptd., and the other not pptd., by Pb acetate. The former was absent from the liver of a case of untreated pernicious anæmia but present in the liver of a treated case. Chromogen occurs in wheat embryo, autolysed yeast, and, to a smaller extent, in baker's yeast but not in yeast-nucleic acid or pentose nucleotides. Anti-anæmic liver preps. vary considerably in their contents of the two types of chromogen. The bearing of the data on the distribution of the "sp. black tongue" purine of Subbarrow *et al.* (A., 1937, III, 8) is discussed. F. O. H.

Action of pancreatic extract on fatty liver. B. Shapiro and E. Wertheimer (Nature, 1937, **140**, 771).—Excessive liver fat of nutritional origin in the rat can be removed by administration of an alcoholic extract of the pancreas. Extracts of spleen, brain, or liver have practically no such effect. Blood-fat and -sugar and excretion of total ketones are un-

affected. No antagonism between liver-fat and -glycogen was observed. L. S. T.

Mechanism of creatine formation. I. S. I. SHIBUYA (J. Biochem. Japan, 1937, **25**, 701—721).—With autolysis and perfusion experiments on rabbit's liver, addition of glycocyamine increased the total equiv. of creatinine; with the perfusion experiments, addition of arginine + glycine + thyroxine had a similar effect. F. O. H.

Rose-Bengal test during muscular work. L. STANOYEVITCH and E. SAVIN (Compt. rend. Soc. Biol., 1937, **126**, 543—547).—Retention of bilirubin in the blood during and after muscular work is attributed to the poverty of hepatic cells in glycogen. Retention of rose-Bengal in men doing heavy work was somewhat more than in those doing moderate work. This retention and hyperbilirubinæmia with hypoglycæmia showed the influence of work on the hepatic cells. D. T. B.

Cholagogue action of *Helichrysium arenarium*. G. PETROWSKY (Arch. int. Pharmacodyn., 1937, **57**, 99—109).—Infusions and decoctions of catsfoot increase the movements of the gut and raise the pressure in the gall-bladder (dog). The quantity and cholesterol content of the bile are increased. D. T. B.

Influence of bile salts on the enzymic synthesis and hydrolysis of cholesteryl esters in serum. W. M. SPERRY and V. A. STOYANOFF (J. Biol. Chem., 1937, **121**, 101—109).—Incubation of Na salts of deoxycholic, cholic, taurocholic, and glyco- and tauro-deoxycholic acids in increasing amounts inhibits esterification of cholesterol in human serum in proportion to the amounts added up to a max. Monkey's serum reacts like human serum, but the first three salts cause hydrolysis in the higher concns. in dog's serum. P. G. M.

General function of the gall bladder. C. R. SCHMIDT and A. C. IVY (J. Cell. Comp. Physiol., 1937, **10**, 365—383).—The concn. of pigment in bile of a no. of species was found to have no relation to the presence or absence of a gall bladder. In the sheep, goat, cow, and pig bile from the gall bladder is no more conc. than that from the hepatic duct, but the gall bladder is large, and its sphincter weak. In the chicken, cat, dog, and man the gall bladder is small, it concentrates the bile 6—10 times, and the sphincter is strong. In the rat, horse, and pigeon the gall bladder is absent, the sphincter weak, and there is a large output of dil. bile. The removal of the gall bladder in the dog causes no change in the anatomy or behaviour of the liver. V. J. W.

Time relations in renal excretion of threshold and no-threshold substances. H. L. WHITE and T. FINDLAY, jun. (Amer. J. Physiol., 1937, **119**, 740—748).—The Bingham type of viscometer was used on serum to detect changes in protein content as small as 0·02%; calibrations on normal human plasma showed that a change of 0·01 in relative viscosity represents a change of 0·072% in protein. A small conductivity cell permitted the detection of changes as small as 1 mg. of NaCl per 100 c.c.; a change of 0·001 in sp. conductivity of normal human serum represents a change of 5·5 mg. of NaCl per 100 c.c. The results confirmed findings of a considerable and persistent rise in serum-Cl and fall in protein on ingestion of isotonic or hypertonic NaCl, and a lag in increased water content behind increased molar concn. of water in plasma; a similar lag was found for Cl′ and glucose. No lag was found in the increased creatinine output in response to increased plasma-creatinine. An initial very slight fall in serum-protein on ingestion of water was followed by a somewhat greater rise above the initial level. The rise occurs at a time when the serum is still diluted with respect to salt. Water output always returns to normal sooner than does molar concn. of water in the plasma. M. W. G.

Influence of temperature on the activity of the kidney in relation to its influence on oxygen consumption. E. J. CONWAY, J. M. O'CONNOR, and D. K. O'DONOVAN (Proc. Roy. Irish Acad., 1937, **44, B**, 1—18).—In rabbits and a human subject the curve of renal activity expressed as an energy equation and that of general O_2 consumption, both plotted against temp., are identical. In the rabbit there are three main phases with min. levels at 34° and 29°; in man the min. level in the temp. range 35·8—37·0° is at 36·2°. A. L.

Secretion of urine in man during experimental salt deficiency. R. A. MCCANCE and E. M. WIDDOWSON (J. Physiol., 1937, **91**, 222—231).—Severe salt deficiency produced experimentally by diet and sweating in 5 normal men was accompanied by (*a*) a rise in blood-urea, (*b*) no obvious change in the power of the kidney to concentrate urea, (*c*) a diminution in the power of ingested water to produce a diuresis, (*d*) a fall in the creatinine, sucrose, inulin, and urea clearances. The clearances of the first three fell together and to the same extent; the fall in urea clearance was proportionately greater. Salt deficiency probably leads to diminished glomerular filtration and also some additional urea reabsorption. A. C.

Conditioned reflexes involving the kidneys. V. L. BALAKSHINA (Trans. physiol. Inst. Leningrad, 1936, **17**, 106—108).—The pituitary is involved in conditioned reflexes effecting secretion of water by the kidney. J. WA.

Denervated kidney. III. Effect of ergotamine and atropine on the uricosuric effect of atophan. G. P. GRABFIELD, B. PRESCOTT, and W. K. SWAN (J. Pharm. Exp. Ther., 1937, **61**, 293—299; cf. A., 1935, 245).—In dogs receiving simultaneously atophan (orally) and ergotamine tartrate (subcutaneously), no increase in the urinary excretion of uric acid and allantoin occurs. When atropine is given instead of ergotamine tartrate, the action of atophan on allantoin excretion is suppressed but that on uric acid excretion is not affected. Hence the increased allantoin excretion produced by atophan results from action on sympathetic connexions outside the kidney, the action of atophan on uric acid excretion being mediated by adrenergic fibres to the kidney and that on allantoin excretion by both adrenergic and cholinergic fibres. W. McC.

Glomerular filtration. Creatinine, sucrose, and urea clearances in subjects with renal disease. A. W. WINKLER and J. PARRA (J. clin. Invest., 1937, **16**, 869—877).—Creatinine, urea, and sucrose clearances were determined in two or more consecutive periods in subjects with acute and chronic nephritis with or without vascular disease, Hg poisoning, vascular disease without evidence of renal disease, and diabetes insipidus. In definite renal disease the size of the three clearances was consistently and uniformly reduced. In nephrosis all the clearances may be normal. In the early stage of acute nephritis the creatinine clearance may be disproportionately high. The decrease of the creatinine clearance with time as seen in normal subjects does not occur in subjects with depressed clearances. The behaviour of the clearances in renal disease is believed to be consistent with their being relative measures of filtration. The degree of reduction of the clearances reflects quantitatively the degree of reduction of glomerular filtration. C. J. C. B.

Creatinine, sucrose, and urea clearances in subjects without renal disease. A. W. WINKLER and J. PARRA (J. Clin. Invest., 1937, **16**, 859—867).—14 subjects, either normal or without renal disease, were examined. The creatinine was given by mouth or intravenously, whilst the sucrose was given intravenously. The clearances were calc. by an extrapolation method which is described. The clearances were subject to considerable variations in the same man but tended to vary together. The order of magnitude of clearance: creatinine > sucrose > urea was rigidly maintained. The creatinine clearances alone sometimes tended to be high in periods immediately following the giving of the creatinine, but decreased as time went on. This behaviour of creatinine may represent varying tubular secretion rather than varying glomerular filtration. All the clearances are fairly satisfactory relative measures of glomerular filtration, but none are abs. measures. Creatinine clearances must be interpreted with caution. C. J. C. B.

Effect of diet on urea clearance in dogs. R. C. HERRIN, A. RABIN, and R. N. FEINSTEIN (Amer. J. Physiol., 1937, **119**, 87—92).—Urea clearance is increased by feeding with meat, acid-pptd. casein, natural and synthetic glycine, *dl*-alanine, and glutamic acid. Lactic, pyruvic, and glycollic acids and deaminated glycine are approx. as effective as the corresponding NH_2-acids, showing that deamination does not cause the effect; fatty acids also increase urea clearance. Gluconic acid does not affect urea clearance, whilst benzoic acid depresses it at low basal vals. and elevates it at high vals. Butter and its unsaponifiable fraction increase urea clearance when fed with starch and "Crisco." R. N. C.

Magnesium metabolism and bile acids. Effect of cholic acid on the excretion of magnesium in normal and splanchnicotomised rabbits. M. YUUKI (J. Biochem. Japan, 1937, **25**, 435—452).—The diminished urinary excretion of Mg in splanchnicotomised rabbits and the Mg excretion of normal rabbits are decreased by subcutaneous injection of cholic acid. Hence urinary excretion of Mg is related to the sympathetic nervous system. F. O. H.

Elimination of ascorbic acid (vitamin-*C*) in normal urine at Rio de Janeiro. G. G. VILLELA (Compt. rend. Soc. Biol., 1937, **126**, 609—612).—The average excretion of ascorbic acid is below 15 mg. per day, particularly in subjects on a diet deficient in vitamin-*C*. H. G. R.

Urinary sodium, chlorine, and potassium in cachexia. M. BRULÉ, R. SASSIER, and J. COTTET (Compt. rend. Soc. Biol., 1937, **127**, 307—309).—In certain forms of emaciation, especially accompanying cirrhosis of the liver, the ratio Na/Cl, normally 1, is considerably diminished. The K of the urine is greatly increased and the ratio Na/K may be as low as 0·02. D. T. B.

Lowering of sodium–chlorine ratio in urine. M. BRULÉ, R. SASSIER, and J. COTTET (Compt. rend. Soc. Biol., 1937, **126**, 310—311).—The Na/Cl ratio is considerably diminished in cirrhosis of the liver with emaciation and the K content is increased. In the ascitic fluid the proportions of Na and Cl are normal, that of K diminished. The breaking down of muscle-tissue is said to explain K increase. D. T. B.

Normal urinary iodine of man. G. M. CURTIS, I. D. PUPPEL, V. V. COLE, and N. L. MATTHEWS (J. Lab. clin. Med., 1937, **22**, 1014—1025).—227 24-hr. urinary I determinations made on 13 individuals without evidence of thyroid disease gave variations of from 7 to 196 μg. per 24 hr. The normal daily fluctuation in urinary I was attributed to variations in I intake. T. H. H.

Volumetric determination of sodium for the ratio sodium : chloride in urine. R. SASSIER (Compt. rend. Soc. Biol., 1937, **126**, 305—307).—A method is described in which the titration of the salt $NaZn(UO_2)_3(OAc)_9$ is carried out in the cold in presence of a large excess of NaOH. H. G. R.

Detection of ascorbic acid in urine. W. KLODT (Med. Klin., 1936, **32**, 421—425; Chem. Zentr., 1936, i, 4177).—Titration with I is unsuitable for clinical work. A modification of Tillmans' method is described. Ergothionine does not affect the results obtained. 24-hr. urine cannot be used for this test since losses on keeping cannot be prevented. The method is not sp. for ascorbic acid in urine but is valuable for clinical purposes. A. G. P.

Experimental calculus of the urinary tract. G. HAMMARSTEN (K. fysiogr. Sällsk. Lund. Förh., 1936, **6**, 185—192).—Oxalate concretions in the urinary tract of rats were produced by diets relatively deficient in Ca and Mg. In order to supply the Ca requirement of the organism during Ca deficiency, skeletal Ca is mobilised to such an extent that urinary Ca was increased and calculus was formed. In Mg deficiency, separation of Mg in the urine and also the capability of the urine to retain CaC_2O_4 in solution were diminished. It was possible, by administration of sufficient Mg, to prevent calculus formation on an otherwise suitable diet. The [Ca] in the urine, on a diet deficient in Mg but sufficient in Ca and vitamins, was high. T. S. G. J.

Pathogenesis of dietary nephritis in the rat. E. M. MEDLAR and N. R. BLATHERWICK (Amer. J. Path., 1937, **13**, 881—895).—24 rats from which one kidney had been removed were fed on a high-animal protein diet and compared with 12 controls after a similar nephrectomy but fed on the ordinary stock diet. The high-protein diet rats showed a progressive degenerative nephritis. The initial lesions were focal injuries in the glomeruli. Later, hyperplasia and dissolution of the tubular epithelium of the glomerular capsule, loops of Henle, and distal convoluted tubule occurred. Finally there were present sclerosis of glomeruli, interstitial fibrosis, considerable chronic inflammatory changes, and cystic dilatation of the proximal tubules. C. J. C. B.

(A) Relation of the lymphatic system to the kidney. (B) Effect of diuresis on lymph and urine secretion. M. YAMAKOSHI (Folia Pharmacol. Japon., 1937, **24**, 95—109, 110—122).—(A) Residual N, protein, and NaCl content of blood and lymph sera, I distribution in both after intravenous injection of NaI, and lymph production are recorded for dogs with the kidney blood vessels or the ureter ligatured.

(B) The effect of isotonic NaCl, Salyrgan, and Euphyllin on the urine and lymph secretion of dogs treated as above are recorded. E. M. W.

Creatine retention in experimental renal insufficiency. A. BOLLIGER and A. L. CARRODUS (Austral. J. Exp. Biol., 1937, **15**, 201—204).—Marked creatine retention occurs in experimental uræmia produced in the dog. The increase in creatine is much greater in the plasma than in the cells. D. M. N.

Excretion of tyramine. R. ENGER and H. ARNOLD (Z. klin. Med., 1937, **132**, 270—282).—A method for determining small quantities of tyramine and other *p*-substituted phenols in urine by means of α-nitroso-β-naphthol is described. The excretion of tyramine etc. is independent of protein and NaCl intake and of the urine vol. It is the same in normal subjects, in essential hypertension, and in acute nephritis without urea retention. When the blood-urea is raised tyramine excretion is diminished. In malign. ant renal sclerosis, tyramine excretion is diminished, even when the blood-urea is normal. In dogs, injection of tyramine (the excretion of which increased 350-fold) raised the blood pressure. T. S. G. J.

Changes in the physiological condition of the new-born infant. III. Renal function and excretion of indigo-carmine and phenolsulphonephthalein. IV. Liver function and excretion of azorubine S, Congo-red, and santonin dyes. T. SHOJI (J. Biochem. Japan, 1937, **25**, 525—532, 533—548).—III. The excretion of the two dyes by puppies indicates that the kidneys do not attain complete excretory function until the 4th or 5th week of life.

IV. The excretion and appearance in the serum of the intravenously injected dyes indicate that in dogs complete function of liver and reticulo-endothelial system is not attained until the age of approx. 30 days. F. O. H.

Porphyrins produced in acute prophyrinuria. E. MERTENS (Z. physiol. Chem., 1937, **250**, 57—79; cf. A., 1936, 503).—The urine of two subjects suffering from porphyrinuria yielded uroporphyrin III together with much smaller amounts of uroporphyrin I and of coproporphyrin III and the fæces of one of these subjects and of two other cases also contained coproporphyrin III together with much smaller amounts of coproporphyrin I. Decarboxylation of the ester of m.p. 242° (Cu compound, m.p. 295°) previously described gives a *Me* ester, m.p. 135° (*Cu* compound, m.p. 165°). The serum contained only traces of coproporphyrin and of a uroporphyrin (possibly uroporphyrin III). In congenital porphyrinuria, chiefly uroporphyrin I is excreted in the urine but in acute porphyrinuria, chiefly uroporphyrin III. The Me_8 ester of uroporphyrin III yields compounds with *Ni*, m.p. 280°; *Ag*, m.p. 260°; *Mn*; *Zn*, m.p. 328°; *Cd*, m.p. 295—298°, and *Fe*. W. McC.

Possible factors in the development of dental caries. M. MIZUMA (J. Biochem. Japan, 1937, **25**, 671—689).—The solubility of human dental enamel is dependent on p_H (insol. at p_H above 6·77 for 50 days at 37°) and increases with age of the teeth and incidence of caries. The liability of the occurrence of caries decreases as the saliva increases in vol., p_H, viscosity, buffering power, and power to produce acids on digestion with aq. sucrose. F. O. H.

Inorganic substances of bones and teeth. R. KLEMENT (Klin. Woch., 1937, **16**, 591—593).—By repeated treatment of $CaHPO_4,2H_2O$ with fresh amounts of Tyrode solution at 37°, inorg. bone material which has an *X*-ray appearance similar to that of the natural material may be artificially produced, both being identical with that of pure hydroxyapatite. The deposition of secondary $CaHPO_4$ in bones is followed by formation of hydroxyapatite, $10CaHPO_4 + 2H_2O = Ca_{10}(PO_4)_6(OH)_2 + 4H_3PO_4$, under the buffer conditions in the serum. F. W. L.

Production of chronic arthritis by indole and other products of tryptophan putrefaction. J. C. FORBES and R. C. NEALE (J. Lab. clin. Med., 1937, **22**, 921—924).—Chronic arthritis with extensive joint changes was produced by the intracapsular injection of indole, skatole, and indolylpropionic acid into the knee joints of rabbits. Control joints injected with equal amounts of the solvent solutions used with the above compounds failed to produce any apparent changes. T. H. H.

Basic amino-acids of keratins. Basic amino-acids of porcupine quills and *Echidna* spines. R. J. BLOCK and M. K. HORWITT (J. Biol. Chem., 1937, **121**, 99—100).—Porcupine quills and *Echidna* spines contain histidine 0·6 and 0·5, lysine 2·2 and 1·8, and arginine 7·3 and 6·6%, respectively, the mol. ratios being 1 : 4 : 11 and 1 : 4 : 12, respectively. P. G. M.

Antibacterial inhibitors (inhibines) and converting substances (mutines) in fresh and raw cow and human milk obtained under sterile conditions. H. DOLD, E. WIZEMANN, and C. KLEINEN (Z. Hyg., 1937, **119**, 525—538).—Inhibines, similar to those found in saliva and nasal secretion, occur in fresh, sterile cow and human milk. They are thermolabile, but are not destroyed by short

heating of the milk to 80°. Mutines, also present, caused *B. pyocyaneus*, *B. prodigiosum*, and *S. pyogenes aureus* temporarily to lose their power to form pigments. The mutines are more heat-resistant than inhibines. J. N. A.

Antagonistic actions of adrenaline and ergotamine on perspiration in the rabbit. A. GASNIER and A. MAYER (Ann. Physiol. Physiochim biol., 1937, **13**, 571—578).—Adrenaline increases and ergotamine decreases perspiration in normal and fasting rabbits. 1 part of adrenaline to 0·13 part of ergotamine injected together produce no effect. D. T. B.

Effect of choline and its derivatives on perspiration. A. GASNIER and A. MAYER (Ann. Physiol. Physiochim. biol., 1937, **13**, 579—591).—Choline, acetylcholine, and "lentine" in moderate doses increase sweating in the rabbit. Eserine also stimulates sweating glands, and increases 6-fold the action of acetylcholine. D. T. B.

Nervous and hormonal control of sweat-glands. A. GASNIER and A. MAYER (Ann. Physiol. Physiochim. biol., 1937, **13**, 620—633).—Normally the cat perspires less than the rabbit. The former reacts more to sweat-stimulating drugs and less to inhibitory agents. D. T. B.

Effect on the composition of sweat of habituation to high temperatures. M. D. MEZINCESCO (Compt. rend. Soc. Biol., 1937, **126**, 540—542).—Exposure of human subjects to high temp. in moist and dry air caused excretion of dil. sweat. Urea and Cl′ were equally diminished, but the former more so in conditions of humidity. D. T. B.

Shock syndrome in therapeutic hyperpyrexia. I. KOPP and H. C. SOLOMON (Arch. Int. Med., 1937, **60**, 597—622).—The mechanism of the production of the severe and sometimes fatal shock, which occasionally occurs when hyperpyrexia is induced in patients by exposure to hot moist air with the prevention of loss of heat, is discussed. W. O. K.

Glutathione in frog tissues. P. A. NICOLL (Amer. J. Physiol., 1937, **119**, 593—599).—Starved *R. pipiens* or *R. clamitans* were used. Tissues were removed quickly, weighed below 5°, and protein-free extracts prepared with 2% sulphosalicylic acid. The average glutathione contents per 100 g. of tissue obtained were: brain 35 mg., heart 32 mg., kidney 29 mg., nerve 10 mg., muscle 6 mg. Study of peripheral nerve showed that there is no change in reduced glutathione content during anoxia in various conditions. The possibility that reduced glutathione functions in some cyclic mechanism or that ·S·S· and ·SH groups play a part in the oxidative mechanisms of nerve is not excluded by these results. M. W. G.

Properties of venom and arachnolysin of *L. indistinctus*. M. H. FINLAYSON (S. Afr. J. med. Sci., 1937, **2**, 151—155).—The venom from the spider *L. indistinctus* is completely detoxicated, after heating at 60° for 30 min., by 1 in 1000 dilution of 40% CH_2O, by 0·01% $AuCl_3$, and by 0·01% $KMnO_4$; it retains its antigenic properties after treatment with CH_2O. It hæmolyses sheep red cells slightly, rabbit red cells readily, but not human or guinea-pig red cells. *L. indistinctus* arachnolysin readily hæmolyses rabbit and human red cells, but not sheep red cells unless guinea-pig serum is added to the system. The arachnolysin hæmolyses guinea-pig red cells; its action is inhibited by heated or unheated guinea-pig serum. R. L. N.

Neutralisation of the antifermenting principle in snake venoms by antivenins. E. CHAIN (Quart. J. Exp. Physiol., 1937, **27**, 49—54).—The inhibition of alcoholic fermentation of glucose by yeast, caused by the presence of dried cobra and black tiger snake venoms, is abolished *in vitro* by the addition of a quantity of antivenin necessary to neutralise the *in vivo* effect of the venom. Normal horse serum has no effect on the inhibition nor the antivenin on the rate of fermentation. T. S. G. J.

Spreading properties of leech extracts and the formation of lymph. A. CLAUDE (J. Exp. Med., 1937, **66**, 353—366).—Increase of capillary permeability by leech extracts is studied by observation of spread of Indian ink mixed with the extract injected into the rabbit's skin. The spreading factor is indiffusible through a collodion sac impermeable to protein, sol. in water and dil. acid, pptd. by acetone inactivated by heat, and gives the reaction for azoprotein, thus closely resembling the testicular spreading factor. The spreading factor and anticoagulant factor of leech extract generally run parallel, but the exact relationship between them is not established. It is suggested that the high osmotic pressure obtained with azoproteins may play a part in the mechanism of spread. A. C. F.

Action of extracts of periodical cicadas. D. I. MACHT (Arch. int. Pharmacodyn., 1937, **56**, 297—302).—Alcoholic and chloroform extracts of dried periodical cicadas contain a substance which is toxic for *Lupinus albus*, mice, rats, and cats and isolated tissues. The extracts depress circulation and respiration in anæsthetised cats. D. T. B.

New hormone from insect heads. B. HANSTRÖM (K. fysiogr. Sällsk. Lund. Förh., 1936, **6**, 58—62).—A hormone causing contraction of the dark chromatophores of prawns is present in the heads of insects. T. S. G. J.

Colour changes in brachyura crustaceans, especially in *Uca pugilator*. S. P. CARLSON (K. fysiogr. Sällsk. Lund. Förh., 1936, **6**, 63—80).—An investigation of the anatomy and physiology of the chromatophores and eyestalks of *U. pugilator* shows that the chromatophoric substance is secreted by a gland in the middle third of the eyestalk. An extract of the eyestalk, causing expansion of the chromatophores, contains a *substance*, which readily diffuses through Cellophane, is sol. in alcohol but not ether, and is stable to hot acid and alkali. T. S. G. J.

Physiological conditions in tissue cultures. H. ZINSSER and E. B. SCHOENBACH (J. Exp. Med., 1937, **66**, 207—227).—Changing conditions in tissue cultures influence the viability of the cells. Acidity develops if the CO_2 evolved is not allowed to escape, particularly if the amount of tissue is too great. Small amounts of tissue relative to the medium are

therefore advisable. The development of acidity may kill the cells, but they can withstand alkalinity up to p_H 9·0. A. C. F.

Composition of "Schunguli" oil.—See A., II, 4.

Highly unsaturated fatty acid $C_{24}H_{38}O_2$ from the oil of the tunny, *Tynnus tynnus*, L.—See A., II, 3.

Stomach carcinoma produced by 1 : 2-benzpyrene. N. WATERMAN (Acta. brev. neerl. Physiol., 1937, **7**, 18—20).—Cancer of the stomach was produced in 5 rats by oral administration of benzpyrene in lard, whereas a colloidal aq. solution was ineffective. T. F. D.

Specific action of ferricyanide on aërobic glycolysis of tumour cells. B. MENDEL and F. STRELITZ (Nature, 1937, **140**, 771—772).—$K_3Fe(CN)_6$ does not check the aërobic glycolysis of kidney medulla of the rat, cat, or guinea-pig. *dl*-Glyceraldehyde inhibits both aërobic and anaërobic glycolysis in kidney medulla. $Fe(CN)_6'''$ appears to act exclusively and specifically on aërobic glycolysis of mammalian tumour cells. L. S. T.

Causes of cancer and the possibility of combating cancer with hydrogen acceptors. A. MÜLLER (Österr. Chem.-Ztg., 1937, **40**, 305).—The abnormal growth factors in tumour tissue are inactivated by H acceptors such as unsaturated sulphides or allylthiourea, or any substances which reduce methylene-blue in presence of light. W. L. D.

Influence of organic substances [from plants] on the growth of transplanted tumours. M. GATTY-KOSTYAL, M. PASZKOWSKA, and Z. ZAKRZEWSKI (Bull. Acad. Polonaise, 1937, **B** II, 7—9).—Aq. extract of a species of Polyporaceae administered orally or subcutaneously to mice suffering from implanted sarcoma prolongs their life and restricts the growth of the sarcoma. W. McC.

Treatment of the R39 rat sarcoma. R. M. BRICKNER (Science, 1937, **86**, 450).—Intraperitoneal injections of neutral-red or azo-blue were followed by intravenous injection of Fe^{III} gluconate in rats inoculated with R39 sarcoma. 47 out of 64 animals showed cessation of tumour growth, with actual recession in about half the cases. Fe^{III} gluconate is non-toxic. Histological study showed that most of the tumour cells were killed. C. A. K.

Photodynamic action of carcinogenic agents. J. C. MOTTRAM and I. DONIACH (Nature, 1937, **140**, 933—934).—Paramecium is destroyed by benzpyrene suspensions (1/10,000) in the presence of light of λ 3500—4100 A., but not in the dark. C. A. K.

Scientific principles of nutrition with changing times. F. LIEBEN (Österr. Chem.-Ztg., 1937, **40**, 298—302).—The stabilisation of the human dietary by reason of research and large-scale manufacture is described. W. L. D.

Statistical treatment of experiments involving equalised fading. Problem of appetite. P. WHITE (J. Dairy Res., 1937, **8**, 307—310).—Rat feeding experimental data are treated statistically on the basis of no. of rats, no. of separate refusals to consume a diet, the median test, and the *Q* test. W. L. D.

Fatty livers in the goose produced by overfeeding. E. FLOCK, J. L. BOLLMAN, H. R. HESTER, and F. C. MANN (J. Biol. Chem., 1937, **121**, 117—129).—Overfeeding on a high-carbohydrate diet produces enlarged fatty livers in geese, the I val. of both liver- and depot fats being decreased. P. G. M.

Effect of acute alimentary carbohydrate unbalance on the alkaline reserve of the pigeon. R. LECOQ (Compt. rend. Soc. Biol., 1937, **126**, 226—227).—A decrease in the alkaline reserve, becoming very marked as death approaches, is observed on a diet containing 66% of galactose together with large quantities of brewer's yeast. H. G. R.

Copper deficiency in sheep in Western Australia. Ætiology of enzootic ataxia of lambs and an anæmia of ewes. H. W. BENNETTS and F. E. CHAPMAN (Austral. Vet. J., 1937, 138—149).—In enzootic ataxia of lambs there occurs a characteristic demyelination of the spinal cord with subsequent sclerosis; the lesions are very similar to the subacute combined degeneration described in human pernicious anæmia. In breeding ewes on pastures where the above disease is found, there occurs a severe macrocytic hyperchromic anæmia. The Cu content of the liver, blood, and milk of affected ewes, and of the livers of ataxic lambs, was much below normal. An adequate supply of Cu is essential for the normal development of the embryo and for erythropoiesis in the adult. E. G. W.

Effects of sodium deprivation on the animal organism. E. DREUT-KEILER, A. ROBINSON, and E. V. MCCOLLUM (Amer. J. Physiol., 1937, **119**, 651—661).—Restriction of rats to a diet containing only 0·002% Na but adequate amounts of other nutritive essentials produced symptoms ending in death. Retarded growth, disturbances of the eyes and reproductive function were noted. Extensive corneal lesions, ulceration, hypopyon, and hæmorrhages occurred. The lachrymal gland was normal. The disturbances in the eyes and œstrus were different from those produced by vitamin-*A* deficiency. In the female sexual maturity was delayed and the œstrous rhythm and reproductive processes were affected. The male remained fertile after 75—96 days on Na-deficient diet. Copulation of Na-depleted females with stock males was not observed. Post-mortem examination showed that all the tissues were affected. The adrenals were orange in colour; the bones were fragile and softer. A Cl-low diet and a Na- and Cl-low diet produced different results. Growth was less retarded and alopecia, restricted to the anterio-dorsal part of the body, was observed. The eyes and bones were normal. M. W. G.

Physiology of zinc in the nutrition of the rat. E. HOVE, C. A. ELVEHJEM, and E. B. HART (Amer. J. Physiol., 1937, **119**, 768—775).—The carbohydrate metabolism of Zn-deficient rats is unaffected, although the glucose tolerance curves show irregularities. Non-protein-N in the Zn-deficient animals rises less

rapidly after feeding with alanine than in animals given Zn; the initial level is lower, and the total rise above this basal level is greater. Serum-protein in deficient animals is less than in animals given Zn; fæcal wt. and fæcal N are greater. Pituitary implants and growth-hormone injections in deficient animals give a definite growth response. Zn deficiency probably causes a delay in intestinal absorption, particularly in the case of N compounds, whilst endogenous metabolism is reduced. R. N. C.

Value of foods other than pollen in nutrition of the honey-bee. M. H. HAYDAK (J. Econ. Entom., 1936, **29**, 870—877).—Bees develop normally when fed on meat scrap or casein mixtures. Young bees were produced only when the food included meat scrap or cottonseed meal. Building activity was normal with all diets except those containing fish meal. A. G. P.

Nutrition of larvæ of bee-wax moth, *Galleria mellonella*. D. N. ROY (Z. vergl. Physiol., 1937, **24**, 638—643).—Confirming earlier observations, it is found that the immature larvæ require substances other than pure wax for normal development. The nature of the enzymes present in their digestive apparatus was studied. In the mid-gut a proteolytic and a lipolytic enzyme were found. The mid-gut has an alkaline, the hind-gut an acid, reaction. The enzyme activity indicates that the diet of these larvæ contains protein; honey is apparently not utilised. B. K.

Mucilage, flour and its decomposition products in the nutrition of suckling infants. E. MÜLLER (Jahrb. Kinderheilk., 1936, [3], **96**, 197—210; Chem. Zentr., 1936, i, 4175).—The sol and gel constituents of cooked and uncooked rice-flour and mucilage are examined. The significance of amylopectins, amylose, and their decomp. products is discussed. Recommended means of characterising these products are given. A. G. P.

Identity of the Goldberger and Underhill types of canine blacktongue. D. T. SMITH, E. L. PERSONS, and H. I. HARVEY (J. Nutrition, 1937, **14**, 373—381).—Syndromes in which fœtid breath and ulceration of the mouth are prominent features can be produced in dogs by two different kinds of deficient diet. The Underhill syndrome appears in dogs receiving meat and yeast and is prevented by cod-liver oil; the Goldberger type of blacktongue is prevented by meat or yeast, but not by cod-liver oil. The clinical and bacteriological features of the two syndromes were found to be indistinguishable; the same groups of fuso-spirochætal organisms were found in each. Lesions of the mouth associated with the presence of these same organisms have been reported in cases of human pellagra. S. J. C.

Effect of diet on susceptibility of canine-hematopoietic function to damage by amidopyrine. D. K. MILLER and C. P. RHOADS (J. Exp. Med., 1937, **66**, 367—382).—Goldberger's blacktongue diet produces characteristic symptoms without severe anæmia after continuous administration for 5—10 weeks. Amidopyrine in doses of 2 g. daily produces depression of hæmatopoiesis, but smaller doses have no effect. Combination of Goldberger's diet with 0·5 g. of amidopyrine daily produces severe anæmia in 2—9 weeks. The reason for this observation is not yet clear. A. C. F.

Relationship of diet to the self-regulatory defence mechanism. II. Lysozyme in vitamin-*A* and uronic acid deficiencies. N. P. SULLIVAN and I. A. MANVILLE (Amer. J. Publ. Health, 1937, **27**, 1108—1115).—The colon contains more lysozyme than other portions of the intestinal tract. -*A*- and uronic acid-deficient rabbits showed 2—4 × normal lysozyme content, but dried apple lowered this to normal. More than 50% of lysozyme was lost in mucus secretion on feeding with various apple supplements. -*A* and uronic acids act as trigger mechanisms in the secretion of lysozymes in mucus. In their absence, it is formed, but cannot be used as a defence mechanism. W. L. D.

Vitamin-*A* deficiency and night blindness in Bantu mine-workers on the Witwatersrand. L. STAZ (S. Afr. J. med. Sci., 1937, **2**, 143—150).—Of 560 native mine labourers examined by the method of Jeans and Zentmire 20% had subnormal dark adaptation, and on re-examination after a period of mine-compound diet all but 4% had recovered. On re-examination of 276 natives, however, 20% were still subnormal. It is concluded that the examination of dark adaptation is of no practical val. in assessing vitamin-*A* assimilation in native mine-workers. R. L. N.

Topical applications of vitamin-*A* and of carotene. I. Absorption of vitamin-*A* from halibut-liver oil. II. Absorption of carotene from the skin. A. C. HELMER and C. H. JANSEN (Studies Inst. Divi Thomæ, 1937, **1**, 1—9, 10—15).—Young rats were protected from xerophthalmia and grew well on a diet deficient in vitamin-*A* when they received daily inunctions of 0·05 ml. of halibut-liver oil or 0·5 mg. of carotene on the skin of the back of the neck. S. J. C.

Nutrition surveys. Vitamin-*A* deficiency among school-children in London and Cambridge. M. K. MAITRA and L. J. HARRIS (Lancet, 1937, **233**, 1009—1014).—Data are recorded and discussed. Vitamin-*A* deficiency as measured by the dark-adaptation test is more prevalent among young children than among adolescents and more prevalent among these latter than among adults. There is no important sex difference. L. S. T.

Vitamin-*A* deficiency as a general ectodermal disorder. A. PILLAT (Merck's Jahrsber., 1936, **49**, 34—47; Chem. Zentr., 1936, i, 4320).—Observations made in China lead to the classification of -*A* deficiency as a systematic disorder affecting the whole ectoderm. A. G. P.

Epithelial metaplasia. K. MCCULLOUGH and G. DALLDORF (Arch. Path., 1937, **24**, 486—496).—In rats with mechanical irritation in the form of a silk thread through the trachea, there was no metaplasia unless a vitamin-*A*-deficient diet was given, but then it occurred earlier than in control rats on -*A*-deficient diet alone. Castrated immature female rats on a normal diet with theelin, or an -*A*-deficient diet

without theelin, showed no metaplasia in the endometrium during the time of the experiment, whereas in similar rats on -*A*-deficient diet together with theelin, metaplasia was invariably present. If -*A* were now added, repair of the epithelium took place despite continued administration of theelin. These facts indicate that the -*A* deficiency is the primary essential condition, whereas the theelin and mechanical irritation are secondary factors. Metaplasia commonly developed in the thyroid gland of rats during -*A* deficiency, but only in association with epithelial hyperplasia. C. J. C. B.

Ceratitis superficialis and vitamin-*A*. F. Stocker (Schweiz. med. Woch., 1936, **66**, 335—337; Chem. Zentr., 1936, i, 4320).—The disease results from deficiency of -*A*, administration of which has a curative effect. A. G. P.

Vitamin-*A* storage in some vertebrate fishes. S. Schmidt-Nielsen, A. Astad, A. Flood, J. Stene, and N. A. Sørensen (Kgl. Norske Videns. Selsk. Skr. [1935], 1936, No. 40, 73 pp; Chem. Zentr., 1936, i, 3858).—The -*A* content of livers of *Macrurus rupestris*, *Gadus esmarkii*, *G. merlangus*, and *G. pontasson* of different ages is examined. The relationship between the % of fat in the liver (F) and the Carr and Price tintometer no. T is given as $d - F = e \log T$, d and e being consts. for an individual species. The -*A* content of the liver is not highest in the most highly nourished fish (high liver-fat). A. G. P.

Vitamin-*A* reserve in the liver of farm animals. K. C. Sen and G. K. Sharma (Indian J. Vet. Sci., 1936, **6**, 128—140).—Goat liver has a higher vitamin content than that of bull, rabbit, or horse. There is wide diversity within each species. Rinderpest in bulls and goats and advanced tuberculosis and theileriasis in bulls are associated with vals. below normal range for the species. R. M. M. O.

Effect of local applications of vitamin-*A* to wounds. A. Chevallier and A. Escarras (Compt. rend. Soc. Biol., 1937, **125**, 1073—1075).—Vitamin-*A* directly applied to wounds increases their vascularity. D. T. B.

Avitaminosis. XIX. Nerve degeneration in albino rats as studied by the freezing-drying method and polarised light with deficiency of vitamin-*A* or of vitamin-*B*. J. Lee and B. Sure (Arch. Path., 1937, **24**, 430—442).—The brain, spinal cord, and the sciatic, trigeminal, and optic nerves from series of rats deficient in vitamin-*B*, -*B* complex, or -*A* were fixed either in liquid air or formalin and examined by polarised light. All the nerves showed some myelin degeneration, whilst in the -B_1 group the axis cylinders were broken in the later stages. The spinal cord showed slight degenerative changes, but the sections of brain were normal. C. J. C. B.

Vitamin antagonism. H. Lotze (Klin. Woch., 1937, **16**, 494—496).—In preps. containing vitamin-*A* and -*C* the latter is practically completely destroyed. This occurs in cod-liver oil to which a solution of -*C* in butyl alcohol has been added, the control being the -*C* in olive oil. -B_1 and -B_2 do not diminish the ascorbic acid titre in olive oil nor protect it in liver oil. F. W. L.

Colorimetric determination of vitamin-*A*. K. Ritsert (Merck's Jahresber., 1936, **49**, 19—33; Chem. Zentr., 1936, i, 4320).—The technique of, and sources of error in the $SbCl_3$ method are examined. A. G. P.

Isolation of crystalline vitamin-*A*. H. N. Holmes and R. E. Corbet (J. Amer. Chem. Soc., 1937, **59**, 2042—2047).—Largely a more detailed account of work previously reviewed (A., 1937, III, 153). Cryst. vitamin-*A*, m.p. 7·5—8°, has been isolated from the liver oils of *Stereolepsis ishinagi* and Atlantic mackerel and from a commercial oil. The -*A* from *S. ishinagi* has *M* 294 (f.p. in *cyclo*hexane), a mol. extinction coeff. of 60,000 (this val. falls considerably for old solutions), and an activity of (probably) 3,000,000 international units per g. The -*A* contains C 83·28 and H 10·44% (average of 5 analyses). H. B.

Morbus maculosus Werlhofi. II. Influence of vitamin-*A*, -B_1, -B_2, -*C*, -*D*, and of egg yolk on the number of thrombocytes in healthy children. II. Influence of vitamin-*C*, -*A*, -B_2, and egg yolk on the number of thrombocytes and time of bleeding. E. Schiff and C. Hirschberger (Jahrb. Kinderheilk., 1936, [3], **96**, 181—190, 191—196; Chem. Zentr., 1936, i, 4175—4176).—II. Administration of egg yolk or vitamin-*A* causes a strong thrombocytosis. This is possibly attributable, not to -*A*, but to the fat-sol. T factor. Among other vitamins only lactoflavin produces a similar effect.

III. The thrombocyte no. is most actively affected by -*A* whilst -*C* has a favourable action on the capillaries. A. G. P.

Coloured intermediate on reduction of vitamin-B_1. F. Lipmann (Nature, 1937, **140**, 849).—A transient greenish-yellow colour, possibly due to a semi-reduced thiazole, is produced by the reduction of a 0·5—1% solution of vitamin-B_1 with hydrosulphite or Zn in N-HCl. L. S. T.

Pharmacology of vitamin-B_1. G. Hecht and H. Weese (Klin. Woch., 1937, **16**, 414—415).—Intravenous injection of mice with -B_1 in amounts of 50 mg. per kg. produced a state of excitement, for 2—3 min.; amounts of 100 mg. per kg. are rapidly fatal. By the subcutaneous route much larger doses (750 mg.—1 g.) were required for lethal effects. Oral doses up to 2 g. were ineffective. In rabbits lethal intravenous doses produced cessation of breathing, followed by arrest of the heart. In normal rabbits 0·5 g. per kg. slightly raised the blood-sugar. Large doses of -B_1 did not influence the blood-sugar action of a subsequent injection of ½ unit of insulin. In guinea-pigs doses of 50—500 mg. per kg. subcutaneously slightly increased the O_2 consumption within the first ½ hr. The R.Q. fell from 0·80 to 0·75 or less. The vol. of urine excreted by fasting rabbits receiving water and -B_1 was double that of controls. Repeated large doses in rabbits and monkeys for 4 weeks produced no physiological or histological evidence of cumulative action. In monkeys acute toxic symptoms occurred with 600—700 mg. per kg. consisting of rapid shallow respiration, restlessness, flaccidity, and cyanosis. Recovery always occurred. F. W. L.

Bisulphite-binding power of the blood in health and in disease with special reference to vitamin-B_1, deficiency. F. H. L. TAYLOR, S. WEISS, and R. W. WILKINS (J. clin. Invest., 1937, **16**, 833—843).—The bisulphite-binding power was determined on oxalated blood from 30 normal subjects and 144 fasting patients. The normal range was 3·7—5·8 mg. per 100 c.c. of whole blood. Measurement of the bisulphite-binding substances gives a quant. index of metabolic disturbances resulting in an increase in carbonyl compounds, but it does not differentiate the various carbonyl metabolites. The bisulphite-binding substances are increased in vitamin-B deficiencies, in unregulated diabetes mellitus, in fevers, in severe congestive circulatory failure, and some less common diseases. Acetone and pyruvic acid contribute to the increase in diabetes but do not explain the increase in bisulphite-binding substances in -B_1 deficiency. The effect of -B_1 in lowering the level of the bisulphite-binding substances in such cases suggests an important oxidative rôle of -B_1 in metabolism. C. J. C. B.

Biological assay of vitamin-B_1. T. MOLL (Mercks Jahresber., 1936, **49**, 57—65; Chem. Zentr., 1936, i, 4320—4321).—A method of assay with pigeons is described: the results are confirmed by rat tests. A. G. P.

Chemical determination of vitamin-B_1 (aneurin). H. WILLSTAEDT (Naturwiss., 1937, **25**, 682).—Aneurin with 2 : 4-dichlorobenzenediazonium chloride gives a yellowish-red product (absorption bands at approx. 493 and 535 mμ.) which is extracted from aq. solution by ether and, by chromatographic adsorption on $Ca(OH)_2$, affords a violet-red band eluted by alcohol. F. O. H.

Stimulation of growth, respiration, and fermentation by bios and bios-like substances. R. J. NORRIS and M. V. RUDDY (Studies Inst. Divi Thomæ, 1937, **1**, 53—64).—Bios prepared by the method of Narayanan stimulates the respiration of yeast cells; marmite acts similarly. This stimulating action is prevented by excess of sugar in the medium. The effects of the factor produced by irradiating yeast on growth, fermentation, and respiration of yeast are very similar to those produced by bios. S. J. C.

Biological assay of dialysed fractions of bios. R. J. NORRIS and M. J. HART (Studies Inst. Divi Thomæ, 1937, **1**, 65—77).—The active factor or factors in crude bios responsible for stimulating growth, fermentation, and respiration were readily dialysable. Indications were obtained that the three stimulating effects might be due to separate factors. S. J. C.

Deficiency syndromes associated with chronic alcoholism. J. ROMANO (Amer. J. med. Sci., 1937, **194**, 645—651).—Of 131 chronic alcoholics 77 presented some degree of neuritis. In 61 of these a previous history of inadequate food intake was obtained. Some degree of anæmia, which responded to Fe therapy, was present in 57% of the total cases. Of the patients with neuritis 32% were completely cured, 61% showed partial improvement, and 6% no improvement, on vitamin-B_1 and -B_2 therapy. R. L. N.

Growth of rats on diets free from lactoflavin. H. VON EULER and M. MALMBERG (Z. physiol. Chem., 1937, **250**, 158—160).—Rats on a diet of caseinogen, rice starch, hardened ground-nut fat, salt mixture, cod-liver oil, and lemon juice, supplemented daily with 6 μg. of aneurin, increased in wt. during 70 days at the rate of 0·7 g. daily when extract of top yeast containing $\not>$0·03 μg. of lactoflavin was added. When the extract was replaced by extract of bottom yeast having the same lactoflavin content, no wt. increase occurred. Hence extract of top yeast contains a growth-factor which replaces lactoflavin. W. McC.

Preparation of *d*-riboflavin from natural sources. R. D. GREENE and A. BLACK (J. Amer. Chem. Soc., 1937, **59**, 1820—1823).—The method involves adsorption on fuller's earth, distribution in immiscible solvents and (finally) acetone, and crystallisation from aq. acetone–light petroleum. The distribution coeffs. of riboflavin between numerous org. solvents and water and saturated aq. NaCl are given. H. B.

Panmyelophthisis with hæmorrhagic manifestations in rats on a nutritional basis. P. GYÖRGY, H. GOLDBLATT, F. R. MILLER, and R. P. FULTON (J. Exp. Med., 1937, **66**, 579—602).—A condition of progressive granulocytopenia, thrombocytopenia, and anæmia in rats, resembling aplastic anæmia in man, is described. This syndrome was seen in 72 out of 319 animals on a diet deficient in vitamin-B_6. Apart from the acrodynia resulting from the -B_6 deficiency, the pathological picture was characteristic of panmyelophthisis. Addition of -B_1, lactoflavin, or -B_6 to the diet had no preventive or curative effect. Administration of Peters' eluate prevented the development of the condition and, in early cases, effected a cure. It is concluded that Peters' eluate contains a maturation factor, belonging to the -B_2 group and differing from the fractions already described, which is necessary for the primary blood-forming function of the reticulo-endothelial system. A. C. F.

Inhibitory effect of ascorbic acid on diphtheria intoxication in guinea-pigs. A. VON JENEY, J. GAGYI, and P. BARANYAI (Deut. med. Woch., 1936, **62**, 54—56; Chem. Zentr., 1936, i, 4030—4031).—Daily administration of vitamin-C increased the resistance of the animals to diphtheria toxin. Organs normally undergoing change in diphtheria (adrenals, pituitary, corpus luteum) are not greatly affected if their -C content is increased by -C administration. A. G. P.

Diabetes and vitamin-C. R. PFLEGER and F. SCHOLL (Wien. Arch. inn. Med., 1937, **31**, 219—230).—Using the Harris and Ray method a considerable shortage of vitamin-C was found in diabetic patients. Carbohydrate metabolism of diabetics after saturation with -C was investigated. Ascorbic acid has no influence on blood- and urine-sugar in patients without insulin, but it increases the destruction of ketones. Ascorbic acid potentiates the action of insulin, so that the doses of insulin may be considerably reduced. This may be explained by assuming that ascorbic acid increases the assimilation of

glycogen in the liver. The usual diabetic diet contains little -*C*. A. S.

Vitamin-*C* nutrition in healthy Europeans, Bantu mine recruits, and subscorbutic Bantu subjects. R. E. BERNSTEIN and J. S. WEINER (S. Afr. J. med. Sci., 1937, **2**, 37—43).—The normal low degree of bodily saturation with vitamin-*C* in the Bantu and the consequent greater susceptibility to scorbutic conditions are related entirely to diet. R. M. M. O.

Vitamin-*C* excretion in man. RAMEL and PIDOUX (Verh. schweiz. Physiol., 1937, No. 12, 18—20).—The excretion in the urine of injected vitamin-*C* runs parallel to its bone-marrow stimulating action. R. M. M. O.

Vitamin-*C* requirements of healthy andlt. G. F. GÖTHLIN, E. FRISELL, and N. RUNDQUIST (Acta med. scand., 1937, **92**, 1—38).—Four schizophrenic, but otherwise healthy, adults were fed on a basal diet containing only 2 mg. of ascorbic acid per day, supplemented by 3-week periods of gradually increasing amounts of ascorbic acid. Vitamin-*C* insufficiency was determined by the no. of petechiæ produced by means of a pressure cuff. The min. daily requirements in mg. per kg. per day for the 4 people were found to be 0·39, 0·44, 0·43, and 0·48. These results are appreciably above those found previously by a different method. These experiments exclude the possibility of the "permeability vitamin" of Szent-Györgyi playing a part in the disappearance of the petechiæ. C. A. A.

Adsorption of ascorbic acid in blood. E. GABBE (Klin. Woch., 1937, **16**, 483—485).—The disappearance of ascorbic acid from whole or hæmolysed blood or from erythrocyte suspensions is not due to an oxidation of the acid, but to adsorption on colloids in the red cells, especially oxyhæmoglobin. The adsorption can be affected by other substances, *e.g.*, NaCl and $NaHCO_3$, but not by the plasma-colloids. Dehydroascorbic acid is adsorbed both by plasma colloids and by intact or hæmolysed corpuscles. F. W. L.

Presence of ascorbic acid in organs and body fluids, especially in urine. H. WIETERS (Mercks Jahresber., 1936, **49**, 93—107: Chem. Zentr., 1936, i, 4321).—The reducing power of human urine cannot be attributed to ascorbic acid the normal presence of which in urine is doubted. Oral administration of large amounts of ascorbic acid is followed by its appearance in urine and by a largely increased reducing power. A. G. P.

Vitamin-*C* concentrations of tissues in acute scurvy. E. NEŠPOR (Arch. int. Physiol., 1937, **45**, 128—134).—In guinea-pigs of both sexes, fed with a -*C*-deficient diet, the fall of ascorbic acid was followed by the method of Martini and Bonsignore (cf. Ber. Physiol., **86**, 581) in the brain, lens of eye, hypophysis, thyroid, adrenals, liver, spleen, ovaries, and testes. All the organs suffered a permanent decrease of ascorbic acid but lost it at different rates: only 4% remained in the adrenals on the 20th day, when about 40% still remained in the brain. Neither the brain nor the testis was completely deprived of the acid on the 28th day. C. E. B.

Vitamin-*C* requirements in man. F. WIDENBAUER (Klin. Woch., 1937, **16**, 600—602).—The method of Harris and Ray was used. In healthy adults the daily requirement of 26—28 mg. and in a 2—3-year-old child 21—22 mg. In pregnancy the requirement increased, *e.g.*, to 71 mg. in the 3rd month. During lactation double the average amount is required. Administration of thyroxine increased the usage, and in general the requirement was parallel to the metabolic rate. In experiments on 10 children, administration of cod-liver oil often decreased the daily requirement. Vitamin-*A* diminished the -*C* usage, especially when this was at a high level. The -*B* complex in the form of yeast did not produce marked effect except when the metabolic rate had been previously increased by thyroxine, in which case a diminution occurred. F. W. L.

Ascorbic acid in anaphylactic shock. G. UNGAR, J. L. PARROT, and A. LEVILTAIN (Compt. rend. Soc. Biol., 1937, **125**, 1015—1017).—Ascorbic acid applied to isolated organs previously sensitised to antigen inhibits the formation of histamine by the subsequent application of antigen. Thus prevents the production of anaphylactic shock. D. T. B.

Determination of vitamin-*C* saturation. I. S. WRIGHT, A. LILIENFELD, and E. MACLENATHEN (Arch. Int. Med., 1937, **60**, 264—271).—An intravenous injection of 1 g. of cevitamic acid was given to 49 subjects to determine the degree of vitamin-*C* saturation in the body. 500 mg. or more is normally excreted in the first 24 hr. and 400 mg. of that is excreted in the first 5 hr. T. H. H.

Determination of ascorbic acid in blood. A. EMMERIE and M. VAN EEKELEN (Biochem. J., 1937, **31**, 2125—2127).—The same vals. were obtained for the ascorbic acid content of extracts of whole human blood, which had been treated with Hg^{II} acetate by titration with 2 : 6-dichlorophenol-indophenol and with methylene-blue. J. N. A.

Relation between vitamin-*D* and internal secretion. A. NITSCHKE (Deut. med. Woch., 1936, **62**, 629—632: Chem. Zentr., 1936, i, 4321).—Administration of vitamin-*D* prevented the onset of dormancy in hedgehogs, possibly by action on the thyroid. Diminished metabolism and blood-I level in rachitic children are corrected by -*D*. A close relation between -*D* and thyroid activity is indicated. A. G. P.

Absorption of vitamin-*D* through the skin. A. C. HELMER and C. H. JANSEN (Studies Inst. Divi Thomae, 1937, **1**, 83—98, 99—108).—A solution of vitamin-*D* incorporated in soap was applied to the skin at the back of the rat's neck for 30—100 sec. and then washed off; 3—4 U.S.P. units of -*D* applied daily for 60 sec. caused appreciable healing of rickets. Severe rickets was almost cured in 15 days by the daily application of 4 U.S.P. units for 5 min. Absorption through the skin seemed to be slower in the summer than in the winter. When small amounts of viosterol dissolved in olive oil were applied similarly, the degree of healing produced in rachitic rats was approx. the same as that brought about by oral administration of the same amount of -*D*. The degree

of rickets produced by a defective diet varied directly with the temp. at which the rats were housed. S. J. C.

Biological methods for assay of vitamin-*D* carriers. W. B. GRIEM (J. Assoc. Off. Agric. Chem., 1937, **20**, 438—444).—It is recommended that the tentative chick test (A.O.A.C. Methods of Analysis, 1935, 351) should be modified by inclusion of a positive control group, by ashing the tibiæ in groups instead of individually, and by substituting a 3-week for the 4-week period. Data justifying the second modification are tabulated. E. C. S.

Biological methods [for assay of] vitamin-*D* carriers. L. L. LACHAT (J. Assoc. Off. Agric. Chem., 1937, **20**, 450—458).—The results of determination of ash by different analysts on identical material may vary by as much as 6% owing to difference in treatment of bone before extraction of fat and ashing. Besides ether–alcohol, a no. of similar solvents may be used for extraction of fat. The determination of bone formation by this method agrees closely with that by *X*-ray diagnosis. E. C. S.

Nomograms for indirect calorimetry. R. MARGARIA (Arch. Sci. biol., Napoli, 1937, **23**, 266—272).—Two nomograms are described. One enables rapid calculations to be made, from the % of O_2 and CO_2 in the expired air, of the % of O_2 consumed, the R.Q., and the calories per l. of air. The other supplies vol. corrections for barometric pressure, temp., and humidity. R. S. CR.

Loss of body heat and disease. W. LANDAUER (Amer. J. med. Sci., 1937, **194**, 667—674).—A discussion of the effect of environment on org. disturbances in Frizzle fowls. R. L. N.

Spontaneous loss of weight in the cat. A. GASNIER and A. MAYER (Ann. Physiol. Physiochim. biol., 1937, **13**, 592—604).—The normal loss of wt. of the cat is 0·6 g. per kg. per hr. The rate is diminished in fasting, increased by exercise and by injection of thyroxine, adrenaline, and histamine. It is diminished by choline, ergotamine, and atropine. The rate of loss is not uniform and the coeff. of irregularity was determined. D. T. B.

Energy expenditure corresponding with water transit in the organism. M. GOMPEL, F. HAMON, and A. MAYER (Ann. Physiol. Physiochim. biol., 1937, **13**, 449—459).—Rabbits were induced to drink six times as much as normal by an increase of NaCl in the food. The O_2 consumption was unaltered. D. T. B.

Invisible water loss in water balance of the body. H. KOEPPE (Klin. Woch., 1937, **16**, 587—589). F. W. L.

Influence of tropical climate on consumption of oxygen during work. A. DE NIEDERHÄUSERN (Atti R. Acad. Lincei, 1937, [vi], **25**, 671—674).—The mean consumption of O_2 after standard work is approx. 20% greater by Italians (and slightly greater still by Somalis) in Mogadishu (temp. 26—30°) than by Italians in Bologna (temp. 16—18°). E. W. W.

Influence of reaction of blood plasma on oxygen consumption in relation to law of isodynamic equivalence. F. KANE and J. M. O'CONNOR (J. Physiol., 1937, **91**, 48—58).—A detailed account of work already noted (Physiol. Abs., 1937, **21**, no. 4638). A. C.

Effect of oxygen tension on cellular metabolism. W. KEMPNER (J. Cell Comp. Physiol., 1937, **10**, 339—363).—O_2 consumption and output of CO_2 and lactic acid were measured for a no. of isolated cells under conditions as nearly as possible those of life. It was found that respiration was lessened with diminished O_2 tension in leucocytes, nucleated red cells, and in all bacteria which were examined in young culture. In non-nucleated red cells the respiration is unaffected. In goose red cells kept at 3·8% O_2 the respiration was lessened by 65% as compared with air, and the R.Q. was reduced to 0·03. V. J. W.

Muscular work and intermediate metabolism. G. G. ALBERTS and S. DIETRICH (Klin. Woch., 1937, **16**, 372—374).—The effect of ergometric exercise was investigated in 10 normal subjects, 10 mild diabetics, 4 diabetics with acetonuria and poor carbohydrate tolerance, 3 normals with acetonuria after 36 hr. starvation, and 4 normals subsequent to prolonged exercise. With work of 600 kg. per m. in 10 min. the average vals. for the groups were respectively: O_2 debt % of total usage, 9·3, 12·6, 14·6, 15·2, 13·5; R.Q., 0·946, 0·912, 0·852, 0·871, 0·843; fat metabolism in % of total, 18, 30, 50, 44, 53; mechanical work % of total energy, 19·5, 18·9, 15·3, 15·8, 18·1. For the production of 1 cal. of muscular work it was calc. that in the normals 5·0 cals. of carbohydrate or 6·2 cals. of fat must have been oxidised; in the mild diabetics giving 5 cals. for carbohydrates the val. for fat oxidation was 6·3; for the normal with acetonuria a similar calculation gave 9·8 for fat, and 9·6 for acidotic diabetics. Therefore during acetonuria 55% more fat must be oxidised to afford a like mechanical energy than without the acidosis. After long-continued exercise the changes in blood-sugar were similar to those after the shorter period, but in the normal subjects with acetonuria blood-sugar fell more markedly after the exercise. The theory is advanced that under conditions such as are present in starvation the fats are no longer changed to sugar in the liver but reach the musculature as β-hydroxybutyric and acetoacetic acids and that this direct usage of fat in the muscles must also take place in acidotic diabetics. F. W. L.

"Redox" properties of skin. R. VON LESZCYNSKI and E. FALIK (Arch. Derm. Syph., 1937, **176**, 120—129).—A method of investigating cutaneous intracellular respiration is described. 0·02% of aq. solution of methylene-blue is injected intracutaneously to form wheals on the volar aspect of the forearms. The time taken to reduce the dye to the leuco-form is measured. In normal skin (227 cases) the time is 60±20 min. F. J.

Cell-free oxidative system in *Ascaris* and some Cestoda. O. HARNISCH (Z. vergl. Physiol., 1937, **24**, 667—686).—Oxidative processes in *Ascaris* and other worms normally living under anaërobic conditions were investigated. The O_2 consumption of body-fluid and tissues was measured. When crushed

tissue particles are immersed in cell-free body-fluid, a considerable O_2 consumption occurs. It is suggested that body- and tissue-fluid contain a cell-free oxidative system which plays an important part in the metabolism of these worms. B. K.

Measurements of metabolism of *Ascaris suillæ*. F. KRÜGER (Z. vergl. Physiol., 1937, **24**, 687—719).—An apparatus for measuring respiration on living *Ascaris* is described. O_2 consumption, output of CO_2 and of fatty acids was determined. The metabolic rate per g. body-wt. increases with decreasing size of animals. The O_2 consumption depends on the partial pressure of O_2. CO_2 production becomes greater when O_2 is admitted. The output of fatty acids reaches a max. at a certain low O_2 pressure. The proportion of the CO_2 output produced by aërobic and anaërobic processes is discussed. B. K.

Metabolism of erythrocytes in presence of methylene-blue. G. MORUZZI (Arch. Sci. biol., Napoli, 1937, **23**, 142—149).—Washed rabbit's erythrocytes suspended in a solution of NaCl, phosphate, and methylene-blue oxidise glyceraldehyde without producing CO_2. The rate of oxidation is not affected by 0·01M-NaF, or by addition of pyruvate or glycerate. The same suspension does not oxidise glycerol, α-glycerophosphate, glycerol + pyruvate, Na glycerate, or methylglyoxal. Fructose and mannose are oxidised about as fast as glucose. Galactose, sorbitol, gluconate, glycuronate, and saccharate are not oxidised. The absence of phosphate does not affect the oxidation of lactate or glyceraldehyde, but with glucose it lowers the R.Q. and the rate of oxidation. R. S. CR.

Effect of ethyl alcohol on oxidation processes. N. N. BLOCHIN (Trans. physiol. Inst. Leningrad, 1936, **16**, 70).—Alcohol introduced (1·25 g. per kg.) into the stomach of cats and dogs increases O_2 consumption in all organs except the brain. Larger doses depress oxidation processes. J. WA.

Aërobic metabolism of the isolated frog's heart poisoned by iodoacetic acid. A. J. CLARK, R. GADDIE, and C. P. STEWART (J. Physiol., 1937, **90**, 335—346).—The ventricle, after perfusion with Ringer's solution until the available metabolites are exhausted, can be revived by addition to the perfusing fluid of Na salts of lactic and pyruvic acids, normal fatty acids from C_3 to C_{10}, alanine, or glutamic acid. Recovery is only partial with succinic and malic acids. methylglyoxal is effective, but glucose and glycerophosphoric acid are ineffective. Iodoacetic acid does not affect oxidation of lactic acid, or formation of NH_3 and/or urea, which if derived from oxidised NH_2-acids accounts for 30% of the O_2 consumption. The R.Q. and other indirect evidence suggest that fat is utilised by the poisoned heart. R. N. C.

Effect of advancing age on the oxygen consumption of rats. J. E. DAVIS (Amer. J. Physiol., 1937, **119**, 28—33).—O_2 consumption falls rapidly in the first 4 months, and slowly for the remainder of life. In œstrous females it is more than in non-œstrous females or males; the sleeping rates of the two latter are practically identical. Relative heat production in man and the rat and their rates of decrease appear to be closely related. R. N. C.

Effect of baths at different temperatures on oxygen exchange and on the circulation. H. C. BAZETT, J. C. SCOTT, M. E. MAXFIELD, and M. D. BLITHE (Amer. J. Physiol., 1937, **119**, 93—110).—O_2 consumption compared with changes in average body-temp. gives Q_{10} about 2·9. R. N. C.

Action of *p*-aminophenol on tissue oxidation. F. BERNHEIM, M. L. C. BERNHEIM, and H. O. MICHEL (J. Pharm. Exp. Ther., 1937, **61**, 311—320).—The O_2 uptake of tissues (*e.g.*, liver, brain, kidney of rat, dog, cat, rabbit) is restricted, often greatly, by the oxidised form of *p*-aminophenol (I) (optimal concn. 0·0001M; optimal p_H 6·4—6·7), the CO_2 production remaining unaffected. The compound does not act in alkaline media, and in acid media its effect disappears after approx. 4 hr., the action being almost independent of the concn. of tissue. It does not affect the autoxidation of cysteine, the oxidation of lactic acid with $FeSO_4$ as catalyst, or the oxidation of acetaldehyde by liver. Cytochrome-*c* does not affect the action of (I). The oxidation of ethyl alcohol, acetic and formic acids, NH_2-acids, glucose, tyramine, choline, and succinate by liver is not affected by oxidised (I) but that of xanthine is specifically inhibited [with (I) concn. 0·00005M, 100% inhibition at p_H 6·4 and 6·7, 50% at p_H 7·8], the effect of (I) not being prevented by adding xanthine. In dogs, the methæmoglobin content of the blood is increased by injecting (I). Since xanthine and hypoxanthine do not account for >50% of the O_2 uptake of tissues, (I) acts on both dehydrogenase systems and the xanthine oxidase system. W. McC.

Effect of muscular work on the level of the specific endogenous nitrogen catabolism. M. D. MEZINCESCO (Compt. rend. Soc. Biol., 1937, **126**, 537—540).—The increased excretion of N is practically wholly as urea, very little variation being observed in the creatinine val. H. G. R.

Mercapturic acid synthesis in animals. V. Effect of naphthalene on growth of rats as related to diets of varying sulphur content. VI. Dependence of extent of synthesis of *p*-bromophenylmercapturic acid in dogs on body-weight. J. A. STEKOL (J. Biol. Chem., 1937, **121**, 87—91, 93—98; cf. A., 1937, III, 173).—V. Dietary taurine, unlike cystine and methionine, does not replace tissue cystine used in the detoxication of naphthalene to *l*-α-naphthylmercapturic acid. Naphthalene decreases food consumption on a S-deficient diet, and appears in the urine in a form from which free naphthalene is liberated on acidification.

VI. Synthesis of *p*-bromophenylmercapturic acid in the dog after const. doses of bromobenzene is a function of body-wt. and is unaffected by addition of *l*-cystine to the diet. P. G. M.

Fate in the animal body of parenterally administered citrin solution. S. HUSZÁK (Z. physiol. Chem., 1937, **249**, 214—216).—At 38° and p_H 7·3 in presence of O_2, citrin is not attacked by the surviving liver, kidney, intestine, muscle, or brain of the rabbit. 40—60% of citrin injected intravenously into rabbits

is excreted in the urine within 1 hr.; after 18 hr. the urine contains only traces. Temporary storage of citrin occurs in the kidney and liver; appreciable amounts are found after 1 hr. in the bile, but only small amounts in the intestine, skin, and blood vessels, and none in the brain and muscles. All the citrin is excreted within 36 hr. Repeated daily injections slightly increase the citrin content of the body. W. McC.

Oxidation of 2-hydroxymethylfurfuraldehyde in the organism. Y. SENDJU (J. Biochem. Japan, 1937, **25**, 487—491).—Liver and stomach tissue of dogs oxidises perfused or ingested 2-hydroxymethylfurfuraldehyde to 2-hydroxymethylpyromucic acid. The oxidation is diminished in dogs during starvation or feeding on a protein–fat diet. F. O. H.

Hydrolysis of acetanilide by tissues. H. O. MICHEL, F. BERNHEIM, and M. L. C. BERNHEIM (J. Pharm. Exp. Ther., 1937, **61**, 321—327).—Rats' liver and kidney (also liver of dog, cat, rabbit, and ox and rats' intestine and brain) contain a dialysable acylase which hydrolyses acetanilide to acid and amine, is pptd. from aq. solution by half saturation with $(NH_4)_2SO_4$ or acetone, and is destroyed by boiling for short periods with acid or alkali, also hydrolyses other acylated compounds (*e.g.*, acetyl-*l*-leucine and -tyrosine, and salicylanilide, but not *N*-methylacetanilide or hippuric acid) at greatly varying rates. Acylase exhibits max. activity at p_H approx. 8, the rate of hydrolysis being independent of acylase concn. Since the amount of methæmoglobin produced when hæmoglobin is shaken with air is not affected by adding aniline, but is greatly increased by adding also liver suspension, and since oxidised *p*-aminophenol is produced when aniline and liver suspension are shaken in air at p_H 7·8 and room temp. for 24 hr., it follows that tissues convert aniline into *p*-aminophenol. W. McC.

Fate of succinic acid in the human body. G. BALASSA (Z. physiol. Chem., 1937, **249**, 217—219; cf. Bernhard, A., 1937, III, 174).—In man neither succinic nor malic acid and only very small amounts of fumaric acid are found in the urine within 24 hr. after ingestion of 5 g. of Na succinate. W. McC.

Variation in the rate of oxidation of ethyl alcohol during fasting in the rat. L. DONTCHEFF (Compt. rend. Soc. Biol., 1937, **126**, 462—464).—With increasing period of fasting, a decrease in the rate is followed by an increase until an approx. const. rate is attained. H. G. R.

Effect of diet on the rate of oxidation of ethyl alcohol in starved homœotherms (rats). L. DONTCHEFF (Compt. rend. Soc. Biol., 1937, **126**, 465—467).—No variation was observed in the rate on a sugar or protein diet, but a decrease of 20—40% occurred on a fat diet. H. G. R.

Fat metabolism. VIII. Fate of sodium salts of saturated dicarboxylic acids in dogs. P. E. VERKADE, J. VAN DER LEE, and A. J. S. VAN ALPHEN (Z. physiol. Chem., 1937, **250**, 47—56; cf. A., 1936, 103; Flaschenträger and Bernhard, A., 1936, 510).—Biological ω-oxidation with subsequent bilateral β-oxidation is not confined to acids having 8—11 C. All normal saturated dicarboxylic acids undergo bilateral β-oxidation and all normal saturated fatty acids undergo it after ω-oxidation. The rate of destruction in the organism of higher dicarboxylic acids is greater than that of lower acids of the series, and hence the amounts of the acids found in the urine after administration decrease as the mol. wt. increases, whilst the lower acids are found in the urine after administration of the higher. W. McC.

Effects of diets low in choline on liver function, growth, and distribution of fat in the white rat. D. L. MACLEAN, J. H. RIDOUT, and C. H. BEST (Brit. J. exp. Path., 1937, **18**, 345—354).—Choline-deficient rats showed an increased deposition of liver-fat (especially marked after 50 days), but a decrease in body-fat when compared with choline-fed controls. Body-wt. fell, but increased again on addition of choline to the diet. Hepatic insufficiency in choline-deficient rats was shown by retention of bromosulphalein, decreased ability of the liver to store glycogen following alimentary absorption of glucose, and a transitory increase in the excretion of ketones after fasting. Ketone excretion fell after longer fasting, although high liver-fat vals. were still obtained. The results indicate that the presence of choline in the diet is necessary for the maintenance of certain functions of the liver and that it favours the normal distribution of fat between the liver and the body depots. R. L. N.

Phospholipin synthesis during fat absorption. C. ARTOM, G. SARZANA, M. SANTANGELO, and E. SEGRÈ (Arch. int. Physiol., 1937, **45**, 32—39).—A single rat was fed at the same time with a massive dose of olive oil and a Na phosphate solution containing a radioactive P isotope; 9 hr. later it was killed and the radioactivity of the lipin phosphate extracts of its tissues was measured. A notable amount of the phospholipins of the liver and intestine had been synthesised from the ingested P, but the phospholipins of muscles, heart, spleen, and plasma were not measurably radioactive. C. E. B.

Pyruvic acid as intermediary product of carbohydrate metabolism. M. I. PROCKOROVA (Trans. physiol. Inst. Leningrad, 1936, **16**, 41—42).—The pyruvic acid content of arterial blood of dogs normally averages 2—4 mg. per 100 c.c. It is increased by ingestion of carbohydrate, injection of adrenaline, and to a smaller extent by insulin. Normally the liver and brain produce the acid, whilst the kidney retains it; when carbohydrate is given, the intestines and cerebrum produce it. The amount in the kidney increases, and the liver decreases its production of the acid, sometimes re-synthesising it into glycogen. J. WA.

Carbohydrate metabolism in guinea-pigs poisoned with diphtheria. F. ADDARI and F. GOTTDENKER (Klin. Woch., 1937, **16**, 678—608).—Changes in blood-sugar were followed before and after the injection of diphtheria toxin, during fasting, and following the injection of glucose, adrenaline, and insulin, and vitamin-*C*. Each substance was injected twice, 36 and 84 hr. after the toxin. In the fasting state the blood-sugar during the first 36 hr. tended to rise, but during the later period the concn. fell.

After a first injection of glucose the hyperglycæmia was less than in the control; after a second injection the response was markedly increased and prolonged. The first injection of adrenaline caused a rise similar to the control, but after the second the response was very weak or absent, corresponding with an impoverishment in glycogen similar to that following adrenalectomy. The animals showed a greatly increased sensitivity to the second injection of insulin, the low level of blood-sugar persisting to the end of the experiment. No muscular spasms occurred although the sugar fell to such a low level. The intraperitoneal injection of vitamin-*C* produced a diphasic response; after a max. within ½ to 1 hr., the sugar level fell and rose again within 5 hr. After the second injection the primary rise was absent. F. W. L.

Significance of lactic and pyruvic acids in glucose metabolism. G. MORUZZI (Arch. Sci. biol., 1937, **23**, 131—141).—Rabbit's erythrocytes are unable to oxidise pyruvate in the presence of methylene-blue. The oxidation of glucose to CO_2 and H_2O cannot, therefore, pass through a pyruvate stage. Lactate can be oxidised to pyruvate, but no further. R. S. CR.

Origin and limits of the specific dynamic action of intravenous glucose. M. WIERZUCHOWSKI (J. Physiol., 1937, **91**, 140—171).—In two female dogs the respiratory exchange was examined during long periods. Glucose was infused at a const. rate during 6 hr. (1—9 g. per kg. per hr.), and the respiratory exchange examined before, during, and after infusion; as a result of the dosage of glucose the excess heat rose with the increasing rate of glucose supply, showing in the entire experiment a total increase from 1·97 to 8·68 cal. per kg. The entire heat increase over basal is 9·30%±0·34 of the heat of the total assimilation of glucose within the whole range of glucose utilisation rates; probably the sp. dynamic action of glucose depends on the quantity assimilated. The only channel of assimilation which seems to be responsible for the connexion between assimilation and heat increase is concerned with the storage reactions of glucose (glycogen, phosphoric esters, and other intermediary reactions). A. C.

Significance of lactic and pyruvic acids in the metabolism of glucose. G. MORUZZI (Arch. Sci. biol., Napoli, 1937, **23**, 131—141).—Erythrocytes (rabbit) in presence of methylene-blue do not oxidise lactic acid to CO_2 and water, but produce pyruvic acid, the R.Q. being zero. The rate of oxidation decreases with time and addition of pyruvic acid. Non-nucleated erythrocytes in presence of methylene-blue do not oxidise pyruvic acid. Hence oxidation of glucose to CO_2 and water occurs at a level higher than pyruvic acid (probably phosphopyruvic acid). The R.Q. of glucose oxidation is increased by pyruvic acid and lowered by lactic acid. Low vals. of R.Q. in presence of methylene-blue are therefore due to partial oxidation of glucose to pyruvic acid. F. O. H.

Relationship between oxidation of glucose and its degradation to lactic acid. Action of sodium fluoride on catalysis by methylene-blue. G. MORUZZI (Arch. Sci. biol., Napoli, 1937, **23**, 50—85).—With mammalian erythrocytes suspended in aq. glucose + methylene-blue, inhibition of lactic acid formation by NaF is parallel to that of CO_2 production, both being total with 0·01M-NaF; that of O_2 consumption is somewhat lower. Washed erythrocytes are more readily affected by NaF than are unwashed. Inhibition of O_2 consumption by NaF does not occur in presence of Na or Li lactate. Reduction in methylene-blue concn. decreases the respiration of the erythrocytes. The O_2 consumption unaffected by variation in (low) [NaF] is due to incomplete oxidation of certain substrates, *e.g.*, triose-phosphoric acid. The inhibition of formation of lactic acid and CO_2 is accompanied by decrease in p_H of the system. In presence of 0·01M-NaF and glucose, respiration is diminished by addition of pyruvic acid; increased anaërobic production of lactic acid indicates that NaF does not affect oxidation of glucose as regards formation of lactic acid. The bearing of the results on glycolytic processes is discussed. F. O. H.

Blood-sugar response to administration of water. A. VISANI (Wien. Arch. inn. Med., 1937, **31**, 113—120).—Drinking 1500 c.c. of water reduces the blood-sugar after 15—60 min. in normal subjects by 20%, whilst the blood-vol. is increased by only 3—4%. The fall of blood-sugar occurs in cases of severe liver disease, and if the water is administered parenterally, and is not affected by large doses of atropine. The mechanism is unknown. A. S.

Influence of fat on concentration of sugar in blood and in urine in diabetes mellitus. M. WISHNOFSKY, A. P. KANE, and W. C. SPITZ (Arch. Int. Med., 1937, **60**, 837—845).—The blood-sugar concn. in diabetic patients was greater 1 and 1½ hr. after the ingestion of glucose than after the ingestion of glucose plus fat although the fasting levels were the same. The glycosuria in both groups was about the same. T. H. H.

Carbohydrate metabolism in epilepsy. L. J. POLLOCK and B. BOSHES (Arch. Int. Med., 1937, **59**, 1000—1023).—The fasting levels for glucose of a series of 90 patients suffering from epilepsy were within normal limits; they could not be correlated to the precedence or succession of attacks or the type of epilepsy (organic or idiopathic). The glucose tolerance was normal. Hypoglycæmia produced in 70 patients failed to cause epileptic seizure. Concn. of Br′ in the blood at high or low levels produced no alteration in the blood-sugar level. T. H. H.

Blood-sugar in colchicine poisoning. F. SANTAVY (Compt. rend. Soc. Biol., 1937, **126**, 633—634).—Poisonous doses of colchicine cause hypoglycæmia in fasting dogs, which is unaffected by pancreatectomy and is independent of the kidney. D. T. B.

Carbohydrate mobilisation. M. C. HRUBETZ and S. N. BLACKBERG (Amer. J. Physiol., 1937, **120**, 222—224).—Normal fed rabbits were given nembutal intraperitoneally (40 mg. per kg). Anæsthetised animals showed signs of recovery in about 1½ hr. and complete recovery in 2½ hr. when adrenaline was given subcutaneously (0·25 mg. per kg.). At the time of recovery from nembutal there was a

profound suppression of glycogenolysis, as evidenced by a diminished adrenaline effect, but injected 30 min. after the administration of nembutal there was a considerable depression of the hyperglycæmia. It was suggested that since the nembutal is withdrawn from the blood and detoxified in the liver, the hepatic cells may be depressed and their glycogenolytic function impaired. M. W. G.

Effect of fluoride on glucose breakdown. G. MORUZZI (Arch. Sci. biol., Napoli, 1937, **23**, 50—85).—The effect of NaF on O_2 consumption, CO_2 production, and on the anaërobic production of lactic acid in the system rabbit's erythrocytes and glucose–methylene blue was studied. The effect on O_2 consumption is less than that on the other two. When lactate is substituted for glucose, NaF does not reduce O_2 consumption. From these experiments and others in which glucose and pyruvate were used as substrate, it is concluded that the aërobic and anaërobic courses of glucose breakdown diverge at the level phosphopyruvic or pyruvic acid. R. S. CR.

Carbohydrate metabolism during muscular activity. E. F. IVANENKO, Z. N. KAZIMIROVA, and M. I. PROCHOROVA (Trans. physiol. Inst. Leningrad, 1936, **16**, 57—58).—The blood of the femoral artery and vein was analysed during rest and muscular exertion in dogs. The peripheral blood-sugar rises or falls depending on the degree of work; blood-lactic acid is increased in the first ½ hr., as lactic acid produced in muscle passes immediately into the blood. During prolonged work, the transference of lactic acid is diminished or abolished. Methylglyoxal also appears in the blood. Pyruvic acid increases in both arterial and venous blood, chiefly the latter, pointing to production in muscle. J. WA.

Effect of glucose administration on the utilisation of β-hydroxybutyric acid by the normal and eviscerated rabbit. I. A. MIRSKY and R. H. BROH-KAHN (Amer. J. Physiol., 1937, **119**, 734—739).—Glucose does not affect the utilisation of ketones by either the nephrectomised or the eviscerated rabbit and hence has no ketolytic effect. Ketonæmia produced by β-hydroxybutyric acid does not interfere with carbohydrate utilisation; it causes a rise of blood-glucose in normal animals, but does not prevent removal of glucose from glucose-treated or eviscerated animals. R. N. C.

Glycolytic activity of red blood cells of various mammals. W. A. ENGELHARDT and A. I. KOLOTILOVA (Trans. physiol. Inst. Leningrad, 1936, **16**, 13—14).—The red blood corpuscles of different species of mammals possess different powers of glycolysis in the intact state. When the cell membrane is broken down by hæmolysis, the cells of the rabbit (possessing a high glycolytic activity in the intact state) exhibit nearly the same activity as those of the pig (which has normally little glycolytic activity). Cells of other species also possess higher potential glycolytic activity than that demonstrated in the intact state. J. WA.

Measurement of tissue glycolysis in serum. II. B. BREKKE and M. DIXON (Biochem. J., 1937, **31**, 2000—2002).—The method of Dixon (A., 1937, III, 303) for determination of the retention curve of serum is simplified so that the whole determination can be carried out in a single manometer with 4 ml. of serum. P. W. C.

Kinetics of the excretion and utilisation of xylose. R. DOMINGUEZ, H. GOLDBLATT, and E. POMERENE (Amer. J. Physiol., 1937, **119**, 429—438).—The time change of the plasma-concn. of xylose in dogs after injection is represented by the equation $C = ae^{-\alpha t} + be^{-\beta t}$, and the rate of excretion varies linearly with the instantaneous concn. in the plasma. The consts. α and β, the ratio b/a, the rates of excretion of xylose per unit of plasma concn., and the proportion of xylose excreted are all independent of the amount of xylose injected, but a varies with this amount. The rate of utilisation of xylose per unit of plasma-concn. or tissue-concn. is const. and independent of the quantity injected; before equilibrium is established it is impossible to ascertain if the rate of utilisation varies with plasma concn. or tissue concn. R. N. C.

Ketone body excretion in the cat. Sex difference and influence of diet, fasting, castration, and male-hormone administration. P. E. CHAMBERLIN, W. H. FURGASON, and V. E. HALL (J. Biol. Chem., 1937, **121**, 599—606).—Normal adult male cats on a diet consisting solely of lean ox heart excrete a much greater amount of ketonic substances than do females. Fasting does not abolish the sex difference, but it does not occur with mixed diets. Castration of male cats causes, after a considerable delay, a fall in rate of excretion; subsequent injection of testosterone produces a return of the excretion to the pre-castration level. J. N. A.

Metabolism of pyruvic acid in animal tissues. P. E. SIMOLA (Suomen Kem., 1937, **10**, B, 22).—Pyruvic acid administered to rats increases the concn. of ketonic substances and lactic acid in the blood. α-Ketoglutaric acid is excreted in the urine; it may be formed by the interaction of pyruvic and acetic acid. J. L. D.

Rate of change of alkali-reserve after ingestion of organic salts. II. Rate of change after ingestion of sodium citrate and sodium bicarbonate. J. CAPE and E. L. SEVRINGHAUS (J. Biol. Chem., 1937, **121**, 549—559; cf. A., 1934, 104).—With normal subjects, plasma-CO_2 rose by 2·2 vol.-% after ingestion of 5 g. of $NaHCO_3$ and by 3·8 vol.-% after 6 g. of Na citrate. These doses are approx. equivs. of 1 l. of orange juice. The peak of the CO_2 rise was usually reached in 30—60 min. After a 20-g. dose of Na citrate, the rise of plasma-CO_2 was 9·6 vol.-%, the peak of the rise occurring after 90 min. J. N. A.

Effect of environmental temperature on creatinine and creatine metabolism in rats. E. F. TERROINE, A. M. DE LA BERNADIE, and P. LELU (Arch. int. Physiol., 1937, **45**, 247—272).—Adult male rats on unlimited water and also on almost creatine-free barley pass a greater vol. of urine at 30° than at 21° or 9°. The daily creatinine excretion per g. is lower at low temp. than at body temp., but the creatine may increase 4—5 times at low temp. Moderate injections of creatine into animals

at 30° do not alter the excretion of creatine or creatinine. Similar injections given to animals in an environment of 5—9° raises the excretion of creatine as long as the injections continue. C. E. B.

Creatine and creatinine metabolism in muscular dystrophy during treatment with glycine. T. ESPERSEN and A. THOMSEN (Acta med. scand., 1937, **92**, 39—60).—Creatine and creatinine excretion in the urine was studied over long periods both before and during addition of glycine to the diet (6 cases). Ingestion of glycine does not increase the urinary excretion as claimed by other workers. Glycine is of doubtful therapeutic val. in muscular dystrophy. C. A. A.

Calcium content of liver and muscle in nephritic rats. P. FAVARGER and E. RUTISHAUSER (Arch. Int. Pharmacodyn., 1937, **57**, 281—287).—Ca and P content is reduced by 35% in the liver and 10—15% in skeletal muscle by experimentally induced renal damage in rats. D. T. B.

Calcium metabolism of the shore crab (*Carcinus mœnas*, Pennant). J. D. ROBERTSON (Proc. Roy. Soc., 1937, **B**, **124**, 162—182).—The arthropods possess a stiff outer covering of chitin secreted by the epidermis; it is cast periodically, and increase in size occurs immediately after ecdysis or moulting. The chitinous covering of many higher Crustacea is hardened by deposition of Ca salts, chiefly the carbonate and phosphate; this forms a protective exoskeleton (under this term are included the endophragmal skeleton and partly calcified foregut). *C. mœnas* was used exclusively in these experiments; the moulting process has been investigated, including the hardening of the soft new skin with Ca salts, and the permeability of the crab to the Ca ions of sea-water. It is permeable to Ca; a new equilibrium is established between [Ca] in the body-fluid and that in sea-water when crabs are placed in sea-water of altered Ca content. Ca is higher in the blood than in the sea-water in which the crabs are living; this is at least partly accounted for by presence of colloids in the blood. An animal weighing 50 g. absorbs about 35 g. of water at the moult. Much of the org. matter and some of the mineral salts are resorbed before the exoskeleton is cast at the moult. Stores of Ca and P in the soft tissues, especially in the hepatopancreas, are used to harden the new skeleton. Soft postmoult crabs absorb Ca from sea-water; this is also used in calcification of the new skeleton. F. B. P.

Influence of copper and a liver fraction on retention of iron. A. P. BARER and W. M. FOWLER (Arch. Int. Med., 1937, **60**, 474—481).—Fe balances were determined for 10 patients with hypochromic anæmia in order to study the effect of Cu and liver extract on the retention of Fe. With Fe in moderate amounts addition of Cu led to a diminished retention but an increased utilisation of Fe. With Fe in large doses, the effect of Cu was negligible. Liver extract caused a slightly reduced retention of Fe. The increase in hæmoglobin in this series of patients was no more rapid with the addition of Cu or liver extract than with Fe alone. T. H. H.

Retention and utilisation of small amounts of orally administered iron. W. M. FOWLER, A. P. BARER, and G. F. SPIELHAGEN (Arch. Int. Med., 1937, **59**, 1024—1028).—Administration by mouth of Fe NH_4 citrate in doses of 1 and 1·5 g. daily to patients with hypochromic anæmia led to retention of Fe such as to correct the previously existing negative Fe balance and to cause a fairly rapid increase in the hæmoglobin content. T. H. H.

Biological importance of ions of zinc, iron, and potassium in cellular development and metabolism. O. KAUFFMANN-COSLA and R. BRÜLL (Arch. int. Pharmacodyn., 1937, **57**, 188—195).—Ions of Zn, K, and Fe influence growth and metabolism in cultures of *Aspergillus niger*. K and Zn catalyse the synthesis of cellulose and K inhibits lipin synthesis. Fe catalyses the synthesis of lipins. D. T. B.

Kinetics of distribution of substances administered to the body. I, II. T. TEORELL (Arch. int. Pharmacodyn., 1937, **57**, 205—225, 225—240).—On the assumption that the distribution of drugs and other substances in the body can be regarded as a series of simple diffusion steps taking place simultaneously and in succession, formulæ have been derived which describe the amount or concn. of a drug in the depot, the blood, and the tissue, and the amount eliminated and inactivated, as a function of time and a few characteristic consts. Quant. relations have been determined, and these may be valid for the distribution of substances injected intravenously or intra-arterially. Special attention is paid to the effects of rapid intravenous injections, slow drip injection, and kinetics of rapidly disappearing substances. D. T. B.

Poisoning by drugs and foods. W. BRANDT (Chem.-Ztg., 1937, **61**, 969—973, 991—994).—A review.

Absorption of digitalis from the small intestine during anoxæmia. E. J. VAN LIERE and G. A. EMERSON (Arch. int. Pharmacodyn., 1937, **57**, 45—50).—Anoxæmia does not affect the rate of absorption of water or digitalis solutions from the intestine of cats. The presence of digitalis in the intestine retards the absorption of water. D. T. B.

Carbon monoxide as tissue poison. E. SCHULZE (Klin. Woch., 1937, **16**, 427—428).—Two groups of infantile guinea-pigs were exposed, the one to atm. containing 4—9% of O_2 every 3 days for 2½ hr. on each occasion, the other to 0·5% of CO for 10—20 min. daily. The treatment lasted 15—20 days. In the first group the thyroids were normal but in the latter there was histological evidence of thyroid hyperfunction. The changes may be due to a primary action on the mid-brain. F. W. L.

Symptomatology of chronic poisoning with oxides of nitrogen. N. A. VIGDORTSCHIK, E. C. ANDREEVA, I. Z. MATUSSEVITSCH, M. M. NIKULINA, L. M. FRUMINA, and V. A. STRITER (J. Ind. Hyg., 1937, **19**, 469—473).—A clinical and biochemical study was made of 127 men exposed to N oxides during 3—5 years; the concn. of the gas was low, only occasionally rising above 0·005 mg. per l. The symptoms (including reduced catalase index and reserve alkalinity of the blood and decreased blood-sugar) form a connected group which can be related

to the properties of N oxides; they are attributed to the resorptive action of N oxides, to hæmolysis, and to disturbed function of the vegetative nervous system. E. M. K.

Paralytic shell-fish poisoning. H. SOMMER and K. F. MEYER (Arch. Path., 1937, **24**, 560—598).—Of 243 cases of paralytic shell-fish poisoning with 16 deaths, 234 were caused by mussels and the rest by clams. Toxicity was tested by injections into mice of acid methyl alchohol extracts of the fish less their digestive glands. The average lethal dose was defined as the amount which would kill a 20-g. mouse in 10—20 min. with typical neurotoxic symptoms such as uneasiness, wobbling gait, strong spasms, and heart block. Poisonous mussels could not be distinguished from normal ones except by animal tests. Mussels with 0·5 mg. of extract as the average lethal dose were found poisonous to man. Numerous species of shell-fish were tested and many were found to contain poison in small amounts. Mussels tended to lose their toxicity on storage. The source of the poison was probably from plankton or adsorbed in the microscopic sand and debris (abioseston). Four different principles toxic for mice were demonstrated in the extracts of shell-fish and plankton. C. J. C. B.

Effects of the paralytic shell-fish poison on nerve cells. W. P. COVELL and W. F. WHEDON (Arch. Path., 1937, **24**, 411—418).—Guinea-pigs, rabbits, and kittens were injected subcutaneously with varying amounts of mussel poison. Acutely poisoned animals showed no alterations in the nerve cells, whilst in chronic poisoning there were mild chromatolysis, some changes in the neurofibrils, and disturbance of distribution of ash in the large cells of the medulla and spinal cord. The smaller ganglion cells of the latter also showed changes in the Golgi apparatus. The mitochondria appeared normal in the nerve cells but showed definite damage in the convoluted tubules of the kidney. C. J. C. B.

Merthiolate in the treatment of tuberculosis. S. L. CUMMINS (Lancet, 1937, **233**, 962—963).—In Besredka's medium Na ethylmercurithiosalicylate slowly sterilises cultures of tubercle bacilli by a bactericidal or possibly a bacteriostatic effect. In Wright's capillary blood clots, its action is restricted. In clinical tests, it is without significant effect. L. S. T.

Activation of "prontosil" *in vitro* by cysteine hydrochloride. E. A. BLISS and P. H. LONG (Bull. Johns Hopkins Hosp., 1937, **60**, 149—153).—Prontosil solution which had no inhibitory action on the growth of β-hæmolytic streptococci *in vitro* showed an inhibiting action after reduction by cysteine hydrochloride. Reduced prontosil solution is active therapeutically in mice infected with hæmolytic streptococci, and it is believed that the active substance here is *p*-aminobenzenesulphonamide. T. F. D.

Mode of action of sulphanilamide in experimental streptococcus empyema. F. P. GAY and A. R. CLARK (J. Exp. Med., 1937, **66**, 535—548).—The action of the drug in the treatment of empyema in rats caused by a special strain of hæmolytic streptococci is described. With direct intrapleural inoculation death occurs in the untreated case in 4—6 days; administration of 1·2 g. daily of sulphanilamide (2% solution) from the outset prevents death of the animal. Sulphanilamide *in vitro* has no effect on the virulence of the organism; when combined with serum it has some inhibitory effect, but never produces sterility such as can be demonstrated *in vivo*. This sterilising action depends on the co-operation of large mononuclear cells (clasmatocytes) at the site of the infection. The cells are formed locally, and this cell formation is not affected by the drug. The bacteriostasis produced by the amide appears to facilitate the normal phagocytosis by the large mononuclear cells. A. C. F.

***p*-Aminobenzenesulphonamide and antipneumococcal serum therapy in type 1 pneumococcal infections of rats.** P. GROSS and F. B. COOPER (Proc. Soc. Exp. Biol. Med., 1937, **36**, 535—540).—Four groups of 14 rats were inoculated intratracheally with type 1 pneumococcal culture. Of the untreated group one survived for 15 days. In the groups treated with antiserum and prontosil, respectively, 11 survived for 15 days and the three that died lived longer in the prontosil group than in the serum group. In the group treated with both prontosil and serum 12 survived. V. J. W.

Cyanosis from sulphanilamide. E. K. MARSHALL and E. M. WALZL (Bull. Johns Hopkins Hosp., 1937, **61**, 140—144).—Cyanosis after sulphanilamide, previously attributed to methæmoglobinæmia or sulphæmoglobinæmia, has been shown to be unaccompanied by any decrease in the O_2-carrying capacity of the blood and may occur without the presence of non-functional Fe pigment. The cyanosis and dark colour of the blood may be due to a black oxidation product of sulphanilamide. T. F. D.

Pharmacological actions of sulphanilamide. F. HAWKING (Lancet, 1937, **233**, 1019—1020).—The amide has practically no action on smooth muscle, heart, blood pressure, liver, or kidneys. In rabbits or cats large doses produce nervous symptoms somewhat resembling decerebrate rigidity. L. S. T.

Chemotherapy of streptococcal infections, particularly streptococcal tonsillitis. A. SMITH (Lancet, 1937, **233**, 1064—1065).—*p*-Amino- and *p*-benzylamino-benzenesulphonamide are equally valuable in the treatment of streptococcal tonsillitis, but the latter is less toxic. L. S. T.

***p*-Benzylaminobenzenesulphonamide in the treatment of scarlet fever.** J. C. HOGARTH (Brit. Med. J., 1937, II, 1160—1162).—In a series of strictly controlled cases of scarlet fever during the period July, 1936—May, 1937, the administration of the amide had no significant effect on the duration of the initial pyrexia, the initial toxæmia, or the incidence of complications. C. A. K.

Sulphanilamide in the treatment of erysipelas. W. R. SNODGRASS and T. ANDERSON (Brit. Med. J., 1937, II, 1156—1159).—270 cases of erysipelas were treated under controlled conditions with (*a*) ultraviolet light, (*b*) sulphanilamide. The latter shortened the duration of spread of the lesion, the duration of primary pyrexia, and the duration of toxæmia; it

reduced the incidence of complications and diminished the tendency to recurrence. Cyanosis occurred in 29% of cases; vomiting, skin eruptions, and drug fever were sometimes seen. C. A. K.

Clinical use of sulphanilamide and its derivatives in treatment of infectious diseases. P. H. LONG and E. A. BLISS (Ann. int. Med., 1937, **11**, 575—592).—Four cases of hæmolytic streptococcal meningitis were treated with sulphanilamide. Two died and two recovered. A concn. of 10 mg. per 100 c.c. in the blood should be maintained. C. A. K.

Treatment of 106 cases of puerperal fever by sulphanilamide (streptocide). L. COLEBROOK and A. W. PURDIE (Lancet, 1937, **233**, 1237—1242, 1291—1293).—106 cases of puerperal sepsis (100 being hæmolytic streptococcal infections) were treated with the amide, usually by mouth. The results were very similar to those previously obtained with sulphamidochrysoidine (Prontosil red) and "Prontosil soluble." Since treatment with these compounds was started, the mortality rate of puerperal sepsis has fallen from 22% to 5·5%, and the average stay in hospital has been reduced from 31·3 to 19·7 days. Met- and sulph-hæmoglobinæmia occurred in 58 cases and caused slight cyanosis but no symptoms. In some cases an after-rise of temp. was thought to be due to the drug. Other toxic effects, such as headache, prostration, paræsthesiæ, visual disturbances, and joint pains, were rare. C. A. K.

Relative oral toxicities for mice of the isomeric aminobenzenesulphonamides. W. J. C. DYKE (Quart. J. Pharm., 1937, **10**, 319—322).—The approx. 50% mortality doses of the *o*-, *m*-, and *p*-isomerides for mice of 20 g. body-wt. are 60—80, 90—100, and 80 mg., respectively. F. O. H.

Distribution of sulphanilamide in the organism. E. K. MARSHALL, jun., K. EMERSON, jun., and W. C. CUTTING (J. Pharm. Exp. Ther., 1937, **61**, 196—204).—The amide, when administered to dogs, is rapidly distributed throughout the body, the various organs ultimately containing concns. approx. proportional to their water contents. In man the concn. in the cerebrospinal fluid is parallel to, but slightly less than, that in the blood. W. O. K.

Renal excretion of sulphanilamide. E. K. MARSHALL, jun., K. EMERSON, jun., and W. C. CUTTING (J. Pharm. Exp. Ther., 1937, **61**, 191—195).—The clearance of the amide by the kidneys (dog) is independent of its concn. in the plasma, is increased by increased rate of urinary flow, and is 20—30% of the simultaneously determined creatinine clearance. W. O. K.

Glycerol, ethylene glycol, propylene glycol, and diethylene glycol. H. G. O. HOLCK (J. Amer. Med. Assoc., 1937, **109**, 1517—1520).—20% of glycerol in the food produced no deleterious effect on rats. A similar concn. of commercial diethylene glycol killed all animals in 2 weeks; in the drinking-water it was more toxic and a 5% solution caused death of the rats in an average of 8 days. Ethylene glycol is more, and propylene glycol less, toxic than diethylene glycol. Non-fatal doses of diethylene glycol inhibited growth and decreased the fertility of rats. R. L. N.

Renal lesions due to diethylene glycol. H. D. KESTEN, M. G. MULINOS, and W. POMERANTZ (J. Amer. Med. Assoc., 1937, **109**, 1509—1511).—Rats were given commercial diethylene glycol in the drinking-water. In a concn. of 3% approx. 50% of the animals died in 2 months. When 5% was given 25% of the rats died in 1 week. 1—2 c.c. of the pure glycol per kg. intravenously killed 32% of rabbits in 8 days. Typical damage to the epithelium of the kidney convoluted tubules was found. Death was due to a resulting urinary obstruction and uræmia. R. L. N.

Effect of chemotherapeutic substances on the *in-vivo* metabolism of trypanosomes. F. GLOWAZKY (Z. Hyg., 1937, **119**, 741—752).—Injection of trypaflavine, thiourea, and *p*-aminophenylarsine oxide into infected rats significantly changes the carbohydrate metabolism of the trypanosomes within 30 min. With atoxyl, the effect occurs after 6 hr., whilst germanin is even slower in action. The effect does not occur with human serum, tissue extracts, or glutathione. The virulence of the trypanosomes is in all cases unaffected. F. O. H.

New trypanocidal substances. H. KING, E. M. LOURIE, and W. YORKE (Lancet, 1937, **233**, 1360—1363).—Of a no. of guanidines, *iso*thiocarbamides, amidines, and amines with alkyl and alkylene chains tested for trypanocidal activity, the most active (undecanediamidine) produced permanent cures in infected laboratory animals, whilst other diamidines had a powerful trypanocidal action *in vitro*. These compounds differ in chemical constitution from known trypanocidal substances, and they do not produce drug-resistant trypanosomes. C. A. K.

Chemotherapy with osmium compounds; inactivity towards syphilis and activity towards *recurrens*. F. JAHNEL (Z. Hyg., 1937, **119**, 613—616).—Intramuscular injection of Os suspended in olive oil, $OsCl_2$, K_2OsCl_6, and $(NH_4)_2OsCl_6$ into rabbits had no action on syphilis. Rh compounds had a definite curative effect. With *recurrens*, the K and NH_4 salts were active when injected intramuscularly into mice. The results of Fischl (A., 1933, 186) are confirmed. J. N. A.

Electrolytes of blood and urine of dogs with acute hepatic injury produced by arsphenamine. L. J. SOFFER, D. A. DANTES, and H. SOBOTKA (Arch. Int. Med., 1937, **60**, 509—521).—Studies of the electrolytes of the blood and urine were made on dogs with acute diffuse hepatic parenchymal damage produced by intravenous injection of arsphenamine. The outstanding changes were pronounced hæmo-concn., a decrease in Cl′ and CO_3, and an increase in inorg. PO_4''' and lactic acid of the serum. The vol. of the urine increased, there was increased excretion of lactic acid and total protein, and a marked reduction in the excretion of Cl′ and inorg. PO_4'''. T. H. H.

Salvarsan eczematides. M. N. WIERSEMA (Arch. Derm. Syph., 1937, **176**, 99—108).—Dry erythematous squamous patches were observed in 2·5% of all cases which received antisyphilitic treatment. F. J.

Chronic arsenical poisoning. L. VAN ITALLIE and T. POTJEWIJD (Pharm. Weekblad, 1937, **74**, 1498—1499).—The As content of the urine, skin scales, hair, and nails from a patient suffering from chronic As poisoning was recorded over a period of several months. The As is slowly eliminated and a very high As content is encountered, especially in the Mees band of the nails and the basal parts of the hair, long after the source of poisoning has been removed. S. C.

Chronic arsenical poisoning during treatment of chronic myeloid leukæmia. E. V. KANDEL and G. V. LEROY (Arch. Int. Med., 1937, **60**, 846—866).—The treatment of 6 patients suffering from chronic myeloid leukæmia with a solution of K arsenite for prolonged periods demonstrates that complications are not rare. 5 of the patients showed herpes zoster, keratosis, cirrhosis, or polyneuritis. T. H. H.

Toxicology of bismuth. R. FABRE and A. OKAC (J. Pharm. Chim., 1937, [viii], **26**, 433—445; cf. A., 1929, 469).—Bi is determined by the method of Picon, which is sp. Different preps. of Bi (Quinby in oily suspension; Bivatol and Oleobismuth in oily solution; water-sol. Quinby) when injected intramuscularly usually cause paralysis. The ratio of [Bi] in corpuscles to [Bi] in the plasma is greater the more chronic is the poisoning. Preps. sol. in oil reach a high val. (1·84) fairly rapidly, whereas those sol. in water are rapidly absorbed and give low vals. for the ratio at first, but rise (2·43) after a few hr. Bi accumulates chiefly in the kidneys, bile, spleen, and intestines; lipin-sol. preps. enter these structures more rapidly than suspensions or aq. solutions. J. L. D.

Effects of ingested lead on the organism. I. In rats. M. K. HORWITT and G. R. COWGILL (J. Pharm. Exp. Ther., 1937, **61**, 300—310).—In young rats on diets high in Ca (Ca : P ratio 1·5), growth, reproduction, growth in two subsequent generations, and hæmoglobin content of the blood are scarcely, if at all, affected by addition of up to 100 mg. of Pb per kg. of diet. When up to 1000 mg. of Pb per kg. are added the check in growth which results is only temporary. The Pb content of the bones increases (especially in males) as that of the diet increases. Blood-Pb also increases, but no correlation is found between the amount of Pb ingested and the blood level. W. McC.

Lesions of lead encephalitis in children. S. S. BLACKMAN (Bull. Johns Hopkins Hosp., 1937, **61**, 1—62).—In acute Pb encephalitis the brain is swollen and hyperæmic, and the exudate forms a milky ppt. of plasma-protein when the brain is placed in alchohol. Lesions are found throughout the entire central nervous system. The microscopical changes which are described in detail are those of a serous inflammation. T. F. D.

Electrolyte balance during recovery from mercuric chloride poisoning. J. H. TALBOTT, F. S. COOMBS, and W. V. CONSOLAZIO (Arch. Int. Med., 1937, **60**, 301—311).—Studies of the blood and urine of a patient suffering from acute Hg poisoning are reported. The chief changes were depletion of base and chloride, an increased concn. of undetermined acid, retention of PO_4''' and N compounds, and a loss of serum-protein and hæmoglobin. The principal renal damage was considered to be in the tubules. T. H. H.

Benzedrine in sea-sickness. J. HILL (Brit. Med. J., 1937, II, 1109—1112).—Benzedrine produced definite improvement in 39 out of 100 subjects suffering from sea-sickness. The coincident administration of belladonna, bromides, or barbiturates enhanced its action. C. A. K.

Pharmacological study of the mechanism of gout. G. P. GRABFIELD (Ann. int. Med., 1937, **11**, 651—656).—In Dalmatian dogs cinchophen increased the excretion of allantoin and uric acid. After denervation of the kidney, uric acid excretion was diminished by cinchophen, allantoin excretion being still increased. From experiments in which ergotamine and atropine were given with cinchophen, it is concluded that the effect of cinchophen on allantoin is mediated through the parasympathetic and its effect on uric acid is mediated through the true sympathetic. C. A. K.

Chemical receptors of carotid gland of the monkey. A. VERDONK (Compt. rend. Soc. Biol., 1937, **126**, 431—433).—Injection of nicotine, lobeline, and sulphides into the carotid artery of *Macacus rhesus*, with branches occluded beyond the sinus, causes arise of blood pressure and hyperpnœa. D. T. B.

Pharmacology of frog's melanophores. T. C. R. SHEN (Compt. rend. Soc. Biol., 1937, **126**, 433—434).—Barbiturates injected into frogs expand the melanophores, but not after hypophysectomy. Cardiazol causes contraction in dark-adapted, expansion in light-adapted, frogs. It acts independently of the pituitary. Eserine produces expansion in hypophysectomised frogs. D. T. B.

Activity of anthelminthics in different oily solutions. G. ETTISCH and S. F. GOMES DA COSTA (Compt. rend. Soc. Biol., 1937, **126**, 596—598).—The anthelmintic action of a substance varies in different oily solutions and in water. The actions on *Ascaris* of benzene, toluene, and non-cyclic substances vary for different solvents and do not depend merely on concn. D. T. B.

Torch oil dermatitis. A. G. KAMMER and R. H. CALLAHAN (J. Amer. Med. Assoc., 1937, **109**, 1511—1516).—Torch oil produced dermatitis in industrial workers probably because of its solvent qualities which remove the normal skin oils. An interrelationship between contact with the oil and the existence of a focus of superficial fungous disease is suggested. R. L. N.

Effect of rauwolfine on the heart. S. DE BOER (Cardiologia, 1937, **1**, 1—8).—The heart rate of frogs, cats, and rabbits decreases after poisoning with rauwolfine (an alkaloid found in a tropical shrub, *Rauwolfia serpentia*). In the frog the refractory period of the heart is increased and the intraventricular conductivity is delayed; the changes of heart rhythm noted are comparable with those following poisoning by digitalis compounds. Rau-

wolfine does not prevent auricular or ventricular fibrillation produced by faradic stimulation, either in cats or in rabbits. A. S.

Pharmacological actions of emetamine and methylpsychotrine. N. SAPEIKA (S. Afr. J. med. Sci., 1937, **2**, 10—14).—Mouse median lethal doses are: emetamine 230, methylpsychotrine 350 mg. per kg., as hydrochlorides. In isolated preps. or *in situ* the heart and conducting tissue are depressed and the coronary vessels dilated; the isolated intestine is relaxed. Blood pressure is lowered with small doses and respiration depressed with larger. Lethal doses produce tremors, restlessness, and clonic and tonic convulsions of the trunk and hind limbs. R. M. M. O.

Mental disturbances from atropine or novatropine given to subjects under the influence of insulin. J. P. QUIGLEY (J. Amer. Med. Assoc., 1937, **109**, 1363—1364).—Moderate doses of atropine or novatropine abolished the subjective manifestations of insulin hypoglycæmia in normal patients. In half the experiments this was followed by amnesia and speech disturbances. A possible danger in administering atropine to a patient in the hypoglycæmic state is indicated. R. L. N.

Adrenaline secretion and eserine. (A) Effect of eserine on the secretion of adrenaline induced by quaternary ammonium esters. J. LÉVY and L. OLSZYCKA. **(B) Effect of eserine on the ganglion-stimulating properties of some substances.** D. KOHLER and J. LÉVY (Compt. rend. Soc. Biol., 1937, **126**, 401—404, 405—407).—(A) Eserine intensifies the secretion of adrenaline due to small doses of choline esters (*e.g.*, formyl, propionyl) which are readily hydrolysed by esterases *in vitro*.

(B) Secretion of adrenaline caused by nicotine, hordenine, lobeline, and "J.L. 407" is probably due to the liberation of a substance of the choline group, since their ganglion-stimulating properties are increased by eserine. H. G. R.

Inhibitory action on intestine of capillary-active substances. M. GUILLOT and O. S. GWAN (Compt. rend. Soc. Biol., 1937, **126**, 318—321).—Li ricinoleate inhibits the action of acetylcholine and of histamine on the isolated gut. Other substances with similar property are Na oleate, taurocholate, benzoate, and salicylate, also saponin. The ricinoleate is adsorbed by the muscle and prevents contact with acetylcholine. D. T. B.

Pharmacological actions of quaternary ammonium salts. J. RAVENTÓS (Quart. J. Exp. Physiol., 1937, **26**, 361—374).—The action of a series of quaternary NH_4 compounds on the isolated muscle of the leech, the frog's rectus abdominis and auricle, and rat's gut is reported. The radical $[NMe_3 \cdot R]^+$, where R = methyl up to cetyl, produces contracture in all tissues studied. Otherwise the responses fell into 3 groups. (*a*) Leech muscle: all radicals produce similar but quantitatively different results. The action was similar to their curariform action on motor nerve endings. (*b*) Rectus abdominis: the action was intermediate between (*a*) and (*c*), resembling more closely the latter. (*c*) Frog's auricle and rat's gut: there is an increase in response up to R = amyl, when reversal occurs and higher members of the series actually inhibit the action of lower members of the series. The response to the $[NR_4']^+$ radical (R′ = up to butyl) showed similar grouping, with less similarity between the leech muscle response and the curariform action. The contractures produced by $[NMe_mEt_n]^+$, where $m + n = 4$, were more complex and could not be classified. $[NMe_3 \cdot CH_2Ph]^+$ resembled in its action $[NMe_3Bu]^+$ rather than $[NMe_3 \cdot C_8H_{17}]^+$, and hence the effect of introducing the Ph group is equiv. to adding 3 C atoms in a straight chain. T. S. G. J.

Effects on intestine of adrenaline and acetylcholine in presence of vagotonin. L. HENNEGUIN and C. FRANCK (Compt. rend. Soc. Biol., 1937, **126**, 352—353).—Subcutaneous administration of vagotonin causes diminution of inhibition of the rabbit's gut by adrenaline, and increase of the stimulation by acetylcholine. D. T. B.

Fatal nicotine poisoning. Report of 24 cases. J. A. BEEMAN and W. C. HUNTER (Arch. Path., 1937, **24**, 481—485).—In man, nicotine poisoning by "Black Leaf 40" causes death in 5—30 min. Convulsive phenomena and a typical posture were absent, but hyperthermia was present. At autopsy a hæmorrhagic gastritis was found with marked hyperæmia of the kidneys. Guinea-pigs given 40% aq. nicotine or "Black Leaf 40" died in convulsions with fixation of the respiratory muscles, the heart still beating. There was no macroscopic gastritis or renal hyperæmia with pure nicotine. C. J. C. B.

Action of nicotine on the neuromuscular system of the crab. D. T. BARRY, A. CHAUCHARD, and B. CHAUCHARD (Compt. rend. Soc. Biol., 1937, **126**, 574—576).—Nicotine depresses nerve fibres in the crab (*Carcinus mænus*). Modifications of excitability were shown by changes of liminal capacity with condenser discharge. The changes, even to complete inexcitability, are reversible if the solution used be not too conc. D. T. B.

Pharmacology of corbasil (3 : 4-dihydroxynorephedrine). K. O. MØLLER (Arch. int. Pharmacodyn., 1937, **57**, 67—93).—The vascular actions of corbasil and adrenaline are compared. Corbasil usually dilates the vessels of kidney and spleen and occasionally of the intestine. It always raises the blood pressure in cats under ether or urethane anæsthesia. Cocaine potentiates the vascular actions of corbasil and adrenaline equally. Cocaine-sensitisation is dependent partly on an action on the peripheral vessels, and partly on the fact that cocaine inhibits or abolishes the blood-pressure-regulating reflexes originating in the vaso-sensory zones. Procaine potentiates the pressor action of adrenaline and corbasil, to a much lower degree than cocaine. The sensitising action of procaine depends exclusively on inhibition of the blood-pressure-regulating reflexes originating in the vaso-sensory zones. D. T. B.

Hepatic and renal lesions produced by lead acetate, *p*-phenylenediamine, and pyrogallol. A. RISI (Arch. int. Pharmacodyn., 1937, **57**, 118—126).—Certain hair dyes were tested for toxicity by

injection in guinea-pigs and rabbits. The toxicity of *p*-phenylenediamine is 2—3 times that of Pb acetate and pyrogallol. Congestion and degeneration were found in the liver and kidney. Basic Pb acetate was found in the liver, kidney, and skin. Absorption of these drugs from human skin might likewise lead to toxic results. D. T. B.

Influence of berberine on effects of barium chloride and pilocarpine on the isolated intestine. F. MERCIER (Compt. rend. Soc. Biol., 1937, **125**, 1070—1074).—Berberine directly depresses the muscle of the gut, but stimulates the parasympathetic supply. It antagonises pilocarpine spasm, but not Ba contracture. D. T. B.

Persistence of eunarcon in the organism. E. GLEY (Klin. Woch., 1937, **16**, 456—462).—Na *iso*-propyl-β-bromallyl-*N*-methylbarbiturate (eunarcon) forms quantitatively in an alkaline medium *in vitro* the corresponding ureide. Peroral administration of the latter results in its complete breakdown, no trace being found in urine, although inorg. Br was demonstrated. The substituted urea is pharmacologically inactive when administered perorally in large doses. The Zwikker Co reaction and microsublimation failed to demonstrate eunarcon in the urine after oral administration. Examination of the blood and urine after intravenous injection in normal subjects demonstrated that the barbituric ring was destroyed in 15—30 min. In ½ hr. hydrolysis of the bromoallyl group had begun and ionised Br was detected in the blood in increasing amounts up to 48 hr., when it appeared in the urine. F. W. L.

Action of narcotics on protozoa. P. V. MAKAROV (Trans. physiol. Inst. Leningrad, 1936, **16**, 109—110).—Narcotics produce changes in the degree of dispersion of the colloids of the nucleus and protoplasm of protozoa. J. W. A.

Comparison of soporifics by the "galvanonarcosis" method in the frog. P. ADLER and C. HRADECKY (Klin. Woch., 1937, **16**, 519—522).—Galvanonarcosis is a reversible paralysis resembling narcosis which can be produced in amphibia and crayfish by the passage of a const. current in the longitudinal axis of the body, the anode being placed at the head and the cathode at the tail end of the animal. When an adequate strength is reached, the animal may be turned on its back in the water, remaining in this position without attempting to recover the normal posture. It becomes active again on cessation of the current. The frog is placed in a bath through which a stream of tap-water flows. The const. current is gradually increased until the threshold strength for galvanonarcosis is reached. This val. is obtained at 12-min. intervals and the results are plotted as a % of the initial val. When a drug has been injected the strength for galvanonarcosis is diminished and by a series of determinations at intervals the course of the action is followed. The "duration of action" has been determined for a no. of narcotics, this being the time within which a 40% diminution of the initial current strength was reached. The standard taken for the "depth of action" is the % diminution of current strength reached during the "duration." F. W. L.

Toxicity and anæsthetic potency of some alkoxybenzoates and related compounds. A. R. MCINTYRE and R. F. SIEVERS (J. Pharm. Exp. Ther., 1937, **61**, 107—120).—The following were tested for anæsthetic action and toxicity in rabbits, guinea-pigs, and men with favourable results: β-diethylaminoethyl 2-hydroxy-3-methyl-, 3-amino-4-ethoxy-, 4-ethoxy-, and -4-propoxy-, γ-diethylaminopropyl 4-ethoxy-benzoate. γ-Dimethylaminopropyl 4-butoxy-3-methylbenzoate is of some promise as a surface anæsthetic. W. O. K.

Hydrolysis of salts of barbituric acids as related to the rate of onset of anæsthesia. M. T. BUSH (J. Pharm. Exp. Ther., 1937, **61**, 134—138).—The apparent dissociation consts. (*pK*) of various barbituric acid derivatives (phenobarbital 7·34, barbital 7·89, amytal 7·89, pentobarbital 8·04, evipal 8·23) are apparently not related to the rate of onset of anæsthesia. W. O. K.

Barbiturate–picrotoxin antagonism. J. C. KRANTZ, jun., C. J. CARR, and F. F. BECK (J. Pharm. Exp. Ther., 1937, **61**, 153—161).—In rats picrotoxin antagonises the depression of O_2 consumption produced by nembutal, although it has no significant effect on the O_2 consumption of normal rats. Adrenaline increases the O_2 consumption both of normal rats and of rats depressed by nembutal, but does not antidote the lethal action of nembutal; hence the antidotal action of picrotoxin against the barbiturates is not primarily due to acceleration of O_2 consumption. The retardation in the rate of reduction of methylene-blue by brain tissues produced by nembutal is not removed by picrotoxin. Picrotoxin does not apparently stimulate respiration through the carotid sinus reflex by the shifting of the acid–base equilibrium of the blood. The antidotal action of picrotoxin against barbiturates is therefore attributable mainly to its convulsive action. W. O. K.

***cyclo*Propane. III. Relation of electrocardiographic changes to the arterial concentrations of oxygen, carbon dioxide, and *cyclo*propane in dogs anæsthetised with *cyclo*propane.** B. H. ROBBINS and J. H. BAXTER, jun. (J. Pharm. Exp. Ther., 1937, **61**, 162—174).—In normal dogs under *cyclo*propane anæsthesia, respiratory arrest was followed by various cardiac irregularities, the arterial blood containing an average of 2·8 vol.-% of O_2. Artificial respiration alleviated the condition despite an increased level of blood-*cyclo*propane. The cardiac irregularities are due not directly to *cyclo*propane, but to anoxæmia. With sufficiently high concns. of *cyclo*propane, an action on the heart may be observed even when the O_2 supply is adequate. W. O. K.

Anæsthesia with *cyclo*propane derivatives. V. E. HENDERSON and S. F. MACDONALD (J. Pharm. Exp. Ther., 1937, **61**, 182—190).—Methyl-, 1 : 2-dimethyl-, and 1 : 2 : 3-trimethyl-*cyclo*propane are not suitable as general anæsthetics, as they produce various undesirable effects, including more marked cardiac irregularities than *cyclo*propane itself. W. O. K.

Effects of ether, chloroform, and *cyclo*propane on cardiac automaticity. W. J. MEEK, H. R. HATHAWAY and O. S. ORTH (J. Pharm. Exp. Ther.,

1937, **61**, 240—252).—In dogs, stimulation (measured by the appearance of ventricular tachycardia after intravenous injection of adrenaline) of the automatic tissue of the heart is effected in decreasing order by *cyclo*propane, chloroform, and ether. With the first two the increase in the irritability of the tissue varies with their concn. W. McC.

Pentothal sodium in intravenous anæsthesia. F. B. MALLINSON (Lancet, 1937, **233**, 1070—1073).—Physiological effects are described, and compared with those of other barbiturates. L. S. T.

Influence of sodium amytal on the blood- and urine-urea-nitrogen. J. L. GOUAX, S. C. CORDILL, and A. G. EATON (J. Lab. clin. Med., 1937, **22**, 704—707).—A study of blood- and urine-urea-N of 50 dogs anæsthetised with large doses of Na amytal shows that this anæsthetic does not seriously interfere with kidney function as measured by urea excretion. T. H. H.

Dialkylaminoalkyl esters of *p*-aminobenzoic acid.—See A., II, 13.

Aminophenyl-2-oxazolines as local anæsthetics.—See A., II, 32.

Tetra-alkylbarbituric acids.—See A., II, 30.

Substituted 2 : 4-diketothiazolidines with narcotic properties.—See A., II, 34.

Pharmacological action of deuterium oxide. II. Evidence from fish melanophores for sympathomimetic action. H. G. BARBOUR and S. B. BOGDANOVITCH (J. Pharm. Exp. Ther., 1937, **61**, 148—152; cf. A., 1937, III, 63).—D_2O (except at high concns.) contracts isolated melanophores of (*Fundulus heteroclitus*); the effect is reversible. Ergotised melanophore cells do not respond to dil. D_2O, whilst with higher concns. the effect is slight. D_2O and adrenaline show potentiation in their actions. W. O. K.

Variations in the sensitivity of frogs to digitaloids of *Magnolia* bark and in the content of active substances in the bark. R. JARETZKY and W. LIER (Arch. Pharm., 1937, **275**, 599—611).—*Rana esculenta* shows a marked seasonal variation in the sensitivity to the digitaloid principles in *Magnolia* bark, a max. and min. resistance occurring in the middle of October and the beginning of August, respectively. Similar variations occur in the action of other cardio-active drugs on *R. temporaria*. Only slight seasonal variations occur in the content of active principles in the bark. H. W.

Blood-bromide in psychotic epileptics. L. MINSKI and J. B. GILLEN (Brit. Med. J., 1937, 850—851).—Although blood-Br′ was high in many cases, no cases of true Br′ intoxication in epileptics were observed. Reduction of the blood-Br′ level effected no change in mental state. A. G. P.

Effect of certain substances on the absorption of insulin. I. Metals. E. M. BAVIN and W. A. BROOM. **II. Tannic acid and zinc.** W. A. BROOM and E. M. BAVIN (Quart. J. Pharm., 1937, **10**, 327—333, 334—342).—I. Small amounts (*e.g.*, 1—75 mg. Zn per 500 units) of Zn, Mg, and Fe (as sulphate or chloride) prolong the hypoglycæmic action of insulin in rabbits, whilst increasing the amount of metal (*e.g.*, to 1·1—2·75 g. Zn per 500 units), eventually completely inhibits the normal insulin response (cf. Maxwell and Bischoff, A., 1936, 250).

II. Tannic acid prolongs the hypoglycæmia due to insulin in rabbits, the prolongation being even more marked when Zn is added to the complex. A max. effect in presence of Zn (1 mg. per 500 units) occurs with a ratio of tannic acid : insulin of 2—3 : 1 (by wt.), the prolongation of hypoglycæmia being then equal to that due to protamine-insulin-Zn suspensions; this ratio equals that necessary for complete pptn. of insulin from aq. solution. F. O. H.

(A) Action of hydrocyanic acid on the respiratory metabolism of the whole organism. (B) Action of methylene-blue alone and with hydrocyanic acid on the respiratory metabolism of rabbits. K. O. MØLLER (Skand. Arch. Physiol., 1935, **72**, 103—114, 115—125; Chem. Zentr., 1936, i, 4175).—(A) The O_2 consumption and CO_2 elimination of urethanised and HCN-poisoned rabbits are examined.

(B) Intravenous injection of methylene-blue increases the O_2 consumption and raises the body temp. of rabbits. Dosages of 40—50 mg. cause a smaller increase of O_2 consumption and less rise in body temp. than 30 mg. Injections of 20 mg. of methylene-blue 45 min. before or 15 min. after injection of NaCN prevents the inhibition of oxidation by NaCN and diminishes the lethal effect. The action of methylene-blue is apparent 1 min. after administration, and is effective against HCN poisoning by inhalation. A. G. P.

Distribution of potassium and calcium ions in the central nervous system on central stimulation or paralysis in different pharmacological conditions. I. Influence of cardiazol and camphor. S. HASHIMOTO (Japan. J. Med. Sci., 1937, IV, **10**, 183—192).—The administration of camphor or cardiazole to dogs produces a general increase in [$Ca^{\cdot\cdot}$] in the central nervous system except in part of the cerebrum, where it decreases. [$K^{\cdot}$] decreases in all parts of the central nervous system except the cerebellum. These results do not agree with Demole's theory. E. M. W.

(A) Influence of deviations from the normal blood pressure on the absorption of sodium salicylate from muscle. (B) Influence of alcohol, adrenaline, and gum arabic on the absorption of sodium salicylate from muscle. (C) Absorption of sodium salicylate from the œsophagus, stomach, small intestine, rectum, uterus, bladder, and abdominal cavity. R. SHIMAZU (Folia Pharmacol. Japon., 1937, **24**, 59—66, 67—72, 73—79).—(A) The rate of absorption of Na salicylate after intramuscular injection in dogs is increased by a rise in blood pressure and decreased by a fall. It is, in all cases, at a max. 30 min. after injection.

(B) Absorption is accelerated by small quantities of alcohol added to the salicylate injected, and retarded by larger quantities (after initial acceleration), and also by adrenaline and large quantities of gum arabic.

(c) Na salicylate injected into the above organs is rapidly absorbed. E. M. W.

***In vitro* culture of fibroblasts. I. Effect of aromatic amines. II. Effect of choline, acetylcholine, and betaine.** M. FUNAYAMA (Folia Pharmacol. Japon., 1937, **24**, 80—88, 89—94).—I. In dil. solutions, the amines studied tend to promote growth of fibroblasts, but as concn. increases, growth is impaired and finally stopped.

II. Similar effects are observed with choline, acetylcholine, and betaine. E. M. W.

Variations in the sweetening power of saccharin. IV. Relative influences of the association of saccharin with substances containing the carbamide group. B. ODDO and A. PEROTTI (Gazzetta, 1937, **67**, 543—552).—The effect of dulcin (p-OEt·C_6H_4·NH·CO·NH_2) in increasing (cf. A., 1921, i, 109) the sweetness of saccharin may be due to its correcting the after-taste of the latter; urea has a similar effect, whilst thiourea increases the unpleasant taste of saccharin. The min. concn. at which sweetness is detected in aq. saccharin is not affected by the (equimol.) presence of dulcin, urea, or thiourea. The effects of these on the p_H of aq. saccharin are also studied. E. W. W.

Effect of parenterally administered peptone. G. MILLES and L. SEED (Arch. Int. Med., 1936, **60**, 251—263).—Where peptone was administered intramuscularly or intravenously to dogs, diuresis of varying degree resulted, depending on the concn. of the solution and on the rate of injection. A pronounced fall in spinal fluid pressure and a slight fall in blood pressure were noted. No antigenic effects were demonstrated. T. H. H.

Piule, a Mexican intoxicating drug. C. G. SANTESSON (Arch. Pharm., 1937, **275**, 532—537).—Qual. tests show that "piule" (seeds of *Impomœa sidæfolia*, Choisy) contains a gluco-alkaloid. Injection of the aq. extract, before or after hydrolysis of the glucoside, into a frog causes partial paralysis of the brain. R. S. C.

Action of the venom of Formosan Crotalinæ K. KYU (Japan. J. Med. Sci., 1937, IV, **10**, 99—127).—The action of venom from *Trimeresurus mucrosquamatus*, *Tr. gramineus*, and *Agkistrodon acutus* on the respiration, blood-pressure, blood vessels, muscles, and organs of dogs, mice, and frogs is described. In most cases initial stimulation is followed by paralysis. Min. lethal doses are recorded. E. M. W.

Physiological properties of *Sarcocephalus esculentus*. RAYMOND-HAMET (Compt. rend. Soc. Biol., 1937, **126**, 488—491).—Extracts of the Nigerian plant "uburu" act as febrifuges in the guinea-pig. Hypotension and renal vasoconstriction follow injection in the dog. D. T. B.

Absolute colorimetric determinations in chemical toxicology. I. Silicic acid in organs. H. KAISER and E. WETZEL (Angew. Chem., 1937, **50**, 865—866).—The tissue is ashed, extracted with 20% Na_2CO_3, and the extract diluted and filtered. An aliquot of the filtrate is treated with Urbach's reagent (B., 1934, 430, 654) and the colour produced examined by the step-photometer, that due to complexes of phosphomolybdic acid being absorbed by a suitable filter. F. O. H.

Quinoline compounds as sources of medicinal compounds.—See A., II, 29.

Cinchona alkaloids in pneumonia. Alkyl ethers of *apo*cupreine.—See A., II, 35.

2-Aminophenylpentoxazolines.—See A., II, 32.

Aminophenyl-oxazoles and -thiazoles.—See A., II, 33.

Artificial production of œstrogenic substances from certain sterols. III. Structure and properties of a synthetic analogue of the follicular ovarian hormone.—See A., II, 18.

Glucosides related to carcinogenic hydrocarbons.—See A., II, 11.

Efficiency of nose in retaining dust in relationship to development of asbestosis. G. LEHMANN (Arbeitsphysiol., 1937, **9**, 572—578).—In 73 workers in an asbestos factory, the efficiency of the nose in retaining dust particles could be correlated with the degree of involvement of the lungs as shown by X-ray examination. Duration of exposure to dust is the other important factor. The danger of pneumoconiosis is three times as great in workers in asbestos as in quarry workers exposed to silicosis-producing dust. E. J. W.

Estimation of efficiency of the nose in retaining dust. G. LEHMANN (Arbeitsphysiol., 1937, **9**, 569—571).—A modification of a method previously described (*ibid.*, 1936, **9**, 206, 293) using the Pulfrich photometer. E. J. W.

Sericite and silica: experimental dust-lesions in rabbits. S. L. CUMMINS (Brit. J. exp. Path., 1937, **18**, 395—401).—Sericite particles with dead tubercle bacilli injected subcutaneously into the ear of two rabbits led to necrosis and sinus formation. SiO_2 particles with dead bacilli, sericite, and SiO_2 alone gave much less severe reactions. Two rabbits were given intra-tracheal inoculation of SiO_2 followed in 5 weeks (in one rabbit) by the intravenous injection of dried tubercle bacilli. Histological examination of the lung lesions showed a more irritative procese than in two animals similarly treated with sericite. R. L. N.

Chemical observations on silicosis. J. B. ROBERTSON, F. W. SIMSON, and A. S. STRACHAN (S. Afr. J. med. Sci., 1937, **2**, 124—135).—The mineral residues from the lungs of 10 cases of silicosis showed a considerable % of sericitic material. Although both cases of slowly and rapidly produced silicosis were examined, there was always a ratio of 2 to 1 between the quartz and sericite present in the mineral residues. It is suggested that the rate of development and extent of the lung lesions depend on the amount of dust inhaled and the rapidity of its concn. in the lung tissue. About 10 times as much SiO_2 is dissolved from quartz as from mica in saline solutions isotonic with blood-serum and of similar p_H; proteins reduce the solubility. These experiments suggest that if solubility to minute mineral particles is an essential factor in the production of silicosis, then silica rather

than a silicate such as muscovite is the chief mineral concerned. R. L. N.

Silicosis from the viewpoint of the mineralogist. H. UDLUFT (Zentr. Gewerb. Unfallverh., 1935, **22**, 81—87; Chem. Zentr., 1936, i, 3878).—Silicosis is caused predominantly by acid minerals. It is suggested that these dissolve, and decompose in the respiratory organs with formation of hydrosilicates such as sericite. H. J. E.

Effects of coal smoke on lungs of animals. L. SCHNURER and S. R. HAYTHORN (Amer. J. Path., 1937, **13**, 799—810). Rabbits and rats were exposed for 80 days in closed chambers to bituminous coal smoke containing 125×10^6 particles per cu. ft., of which only 4×10^5 were free SiO_2. Immediately after the exposure the animals' lungs were deeply pigmented and the amounts and distribution of the black pigment were similar to those in moderate anthracosis. Animals kept, after exposure, several months to a year under ordinary conditions in the animal house developed fibrous reactions about the C deposit with the formation of collagen strands. C. J. C. B.

Danger of industrial solvents to the human organism. O. SCHULZ (Gasmaske, 1935, **7**, 126—128; Chem. Zentr., 1936, i, 4325).—The dissolution of fat, especially of the skin and nervous system, by the more volatile solvents is discussed. A. G. P.

Radiation in factories and houses. H. M. VERNON (J. Ind. Hyg., 1937, **19**, 498—505).—The globe thermometer was used to measure the effects of radiant heat; these readings, together with those of a kata-thermometer (Ag-bulbed), afforded the data for calculating the equiv. temp. It was found that under the conditions of air movement usual in factories or in dwelling-houses, the equiv. temp. was fairly constantly 3° below the globe temp. Under ordinary factory conditions the workers appeared to be little affected by radiation; in a tinplate factory, however, where the metal is worked red-hot, the globe thermometer showed an excess temp., due to radiation, of 35—40°. In dwelling-houses the globe thermometer temp. differed little from the air temp. if direct radiation from a heating source was avoided, but direct radiation from a gas or coal fire caused excess globe temp. up to 75° when the thermometer was placed near the heat source. E. M. K.

Pathological reactions produced by work in hot and humid environment in the Witwatersrand gold mines. A. O. DREOSTI (S. Afr. J. med. Sci., 1937, **2**, 29—36).—Heat stroke occurs in unacclimatised persons doing heavy work. There is no parallelism between the body temp. attained and the seriousness of the attack. Susceptibility to a second attack is increased when a first has been survived. Heat stroke can be prevented by acclimatisation. R. M. M. O.

Vertical force exerted during walking. H. SCHENK (Arbeitsphysiol., 1937, **9**, 489—495).—An optical method was used to measure this force under varying conditions. The component due to the heel is greater than that due to the balls of the toes. The force is increased with increasing rates of walking and by walking on tip-toes or on the heels. It is uninfluenced by footwear. E. J. W.

Experimental *X*-ray anæmia in the guinea-pig. R. BENDA, P. THOYER-ROZAT, and D. A. URQUIA (Sang, 1937, **11**, 886—890).—The use of general radiation of guinea-pigs is suggested as a more const., rapid, and simple method of producing anæmia for experimental purposes. The technique and results in 14 animals are given. Anæmia was easily produced, but white cell changes were not const. C. J. C. B.

Effect of different kinds of radiant energy and convected heat in nitrogen exchanges of tissues. E. KURLANDSKAJA (Bull. Biol. Méd. exp. U.R.S.S., 1936, **1**, 434—436).—Exposure of the perfused rabbit's ear to heat, infra-red rays, and a Hg lamp increases the total N in the perfusate. J. WA.

Chemical studies on bioluminescence. IV. Salt effects on the total light emitted by a chemiluminescent reaction. R. S. ANDERSON (J. Amer. Chem. Soc., 1937, **59**, 2115—2117; cf. A., 1936, 360, 1534).—The total light emitted by a given amount of *Cypridina* luciferin with *Cypridina* luciferase in presence of O_2 increases regularly with increasing [NaCl] in the mixture. The chemiluminescence is increased by addition of KCl, KBr, KF, KNO_3, $K_2C_2O_4$, and K_2SO_4, but decreased by KCNS and KI. The negative effect of KCNS or KI can be compensated by addition of NaCl. E. S. H.

Alternating-current impedance of grasshopper egg over a wide frequency range. K. S. COLE and T. L. JAHN (J. Cell. Comp. Physiol., 1937, **10**, 265—275).—Impedance measurements were made at frequencies of $30—2{\cdot}5 \times 10^6$ cycles, before and after formation of the cuticulin layer, in various saline media. In each case the membrane is equiv. to an impedance and a resistance in parallel and the impedance is independent of the medium. At a frequency of 1000 it has a val. of 0·027 μF. per cm.^{2} with a phase angle of 81° in the pre-cuticular state and a val. of 0·1 μF. per cm.^{2} with a phase angle of 85° in the post-cuticular state. The resistance in the pre-cuticular state depends on that of the medium and in the post-cuticular state is independent of it. V. J. W.

Potential differences in *Amœba*. F. BUCHTHAL and PÉTERFI (Protoplasma, 1937, **27**, 473—483).—Potential differences between the cell and culture media were measured for *A. sphæronucl.* and *A. proteus* grown on agar, the differences being 0·5—1·5 mv. and 1—3 mv., respectively. The influences of age of cell, presence of cell nucleus, ionic concn. within the cell, and oxidative processes were considered in detail. V. B. W.

Biological phenomena of membranes. (A) Equilibrium in the system aqueous humour-plasma and Derrien's law. Y. DERRIEN and G. JAYLE. **(B) Equilibrium of the system plasma-transudate (ascitic liquid).** Y. DERRIEN, G. JAYLE, and P. FRIZET (Compt. rend. Soc. Biol., 1937, **126**, 363—365, 366—368).—(A) Results indicate that Derrien's law can be extended to the equilibrium between blood and aq. systems.

(B) Results agree with Derrien's rather than with Donnan's law. H. G. R.

Osmotic regulation in fresh-water fishes by active absorption of chloride ions. A. KROGH (Z. vergl. Physiol., 1937, **24**, 656—666).—The regulation of the salt content in various fish was studied. The animals were washed with distilled water and then exposed to known salt solutions, their ionic concns. (mainly Cl) being determined at intervals. Some fresh-water fish are capable of restoring salt loss (by diffusion, through injured skin, urine) by active absorption of Cl′ from very dil. solutions (not more than 0·02 millimol., in some species). The absorption takes place in the gills. Br′ is accepted like Cl′, whilst I′ or NO_3' is not taken up. Large species differences in the power of active absorption are found. The functional significance of this mechanism (generally important for fishes living in mountain lakes or streams, and further, assisting them to survive skin injuries) is emphasised. B. K.

Determination of permeability of animal tissue cells. H. GROSSFELD (Bull. Acad. Polonaise, 1937, **B**, II, 249—259; cf. A., 1936, 1292).—With substances osmotically active in tissue cells, the limiting concn. in aq. media at which added neutral-red produces granular vital staining is characteristic for each substance and is indicative of its rate of permeation. Substances with a limiting concn. below that of Ringer's solution (0·16M) give a normal uptake by cells. Comparison of substances at more than the limiting concn. and the determination of rates of permeation are applied to various tissue cells. F. O. H.

Permeability of frogskin to water and heavy water. G. VON HEVESY, E. HOFER, and A. KROGH (Skand. Arch. Physiol., 1935, **72**, 199—214; Chem. Zentr., 1936, i, 4323—4324).—The permeability to D_2O of isolated frogskin and of the skin of the living frog leg is the same in both directions. Permeability to water is proportional to viscosity and declines with falling temp. Section of the leg nerves increases the permeability of the skin by approx. 30%. A. G. P.

Permeability of the reed membrane. I. Dynamics for non-electrolytes.—See A., I, 28.

Osmotic pressure and vital staining. H. GROSSFELD (Bull. Acad. Polonaise, 1937, **B** II, 261—274).—The granular vital staining of tissue cells by neutral-red is reversed by change in the osmotic pressure of the external medium. Thus lowering of the pressure produces decolorisation of the cell elements; with certain electrolytes, however, a large decrease maintains the staining of the cells. The phenomena are independent of the physiological range of p_H and of the presence of O_2 or KCN. The mechanism of the staining reaction is discussed. F. O. H.

Identity of the alcohol contents of the water of aquatic animals and that of the external medium. "Bound" water in proteins. M. NICLOUX (Compt. rend. Soc. Biol., 1937, **126**, 459—461).—The theory of "bound" water is supported by the alcohol concn. in the body-fluids and tissues of an aquatic animal placed in dil. alcohol being equal to and below, respectively, that of the external medium (A., 1937, III, 348). H. G. R.

Polarographic examination of the protein in cerebrospinal fluid. O. SEUBERLING (Klin. Woch., 1937, **16**, 644—645).—The conditions for obtaining polarograms from 0·1—0·3 c.c. of the fluid were investigated. Determinations of the polarographically active cystine groups in the protein present can be made. F. W. L.

Hydrotropic solubility of fat-pigments and lipins. A. HADJIOLOFF (Naturwiss., 1937, **25**, 762—763).—The solubility of fat-pigments and lipins in water is increased by addition of a hydrotropic substance. The following were hydrotropically active for the Sudan colours: caffeine citrate and benzoate, saponin, sulphosalicylic acid, trichloroacetic acid. Their activity increases with concn. Substances active towards fat colours (Na benzoate, tartaric acid, Na and K tartrates, oxalic and citric acid) were inactive with respect to Sudan colours. A. J. M.

Rhythmic wall crystallisation and sedimentation of fat-pigments and lipins from their solutions in organic solvents. A. HADJIOLOFF (Naturwiss., 1937, **25**, 763).—Under certain conditions some fat-pigments and lipins crystallise from org. solvents (methyl and ethyl alcohol, ether, light petroleum, acetone, chloroform, xylene, etc.) in rhythmic layers. A. J. M.

Activity of different oily solutions of the same substance [for perfusion studies on intestinal worms]. G. ETTISCH and S. F. G. DA COSTA (Compt. rend. Soc. Biol., 1937, **126**, 596—598).—The activity varies not only with the concn. of the solute, but also with the solvent employed. H. G. R.

Rate of reaction and concentration of enzyme. J. BERKSON (Science, 1937, **86**, 373—374).—Bodansky's contention (A., 1937, III, 352) that the relation between these two factors is linear is supported. L. S. T.

Analytical measurements of ultracentrifugal sedimentation.—See A., I, 49.

Oxidation and reduction in biochemistry. A. BARRETTO (Bol. Min. Agric. Brasil, 1937, No. 4—6, 75—82).—A lecture.

Active groups of enzymes. P. KARRER (Bull. Soc. chim. Belg., 1937, **46**, 351—363).—Work of the author and others on lactoflavin and on the function of nicotinamide in cozymase (codehydrase I) and the H-transporting co-enzyme (codehydrase II) is reviewed. W. O. K.

Dehydrogenases. A. VON SZENT-GYÖRGYI (Z. physiol. Chem., 1937, **249**, 211—213).—In the processes described by Banga and Straub, the only true dehydrogenase involved is that of the hexose or triose phosphate, the other dehydrogenases acting as H carriers and activators which, combined as prosthetic groups to the dicarboxylic acids, enable them to transfer H. The actual reducing agent is succinic acid although possibly activated malic acid reduces when no succinic acid remains. Limiting factors in the reduction (of dyes, pigments, or O_2) are: amount of C_4-acid or of yellow enzyme, amount

and activity of activators, and diffusion or adsorption of dye or pigment. Malonic acid chalk inhibits only when activation of succinic or fumaric acid is the limiting factor. Probably substances other than triose phosphate and succinic acid are oxidised in the same way. W. McC.

Coupled action of dehydrogenases in catalysis by C_4-dicarboxylic acids. F. B. STRAUB (Z. physiol. Chem., 1937, **249**, 189—199; cf. Ogston and Green, A., 1935, 1277).—Cytochrome in presence of extract of pigeon's breast muscle is reduced by malic and fumaric acid, but much more slowly than by succinic acid. The rate of reduction by malic and fumaric acid is increased nearly to that by succinic acid if inhibition by the oxalacetic acid produced is prevented by addition of glutamic acid. In presence of succinic and malic dehydrogenase, cytochrome is reduced more rapidly by added succinic acid than by added malic acid even when much more malic than succinic dehydrogenase is present. The reduction of cytochrome by malic acid in presence of the extract is inhibited by malonic acid after (but not before) incubation of the mixture at 37° for 30 min. which diminishes the activity of malic but not that of succinic dehydrogenase. Hence the reduction of cytochrome is not accomplished by the malic acid–malic dehydrogenase system but by the fumaric acid–succinic dehydrogenase system, fumaric acid acting as intermediary. Similarly methylene-blue and (slowly) gallophenine are reduced by the fumaric acid–succinic dehydrogenase system from muscle, liver, or kidney. Malonic acid inhibits reduction of methylene-blue but greatly stimulates that of gallophenine. The difference in behaviour between methylene-blue and gallophenine is in accord with the difference between their oxidation–reduction potentials. W. McC.

Coupled action of dehydrogenases with enzyme preparations. I. BANGA (Z. physiol. Chem., 1937, **249**, 200—204).—The slow reduction of methylene-blue by hexose mono- or di-phosphate in presence of the sediment from extract of pigeon's breast muscle is greatly accelerated by adding the activator. The reduction is inhibited by malonic acid if the sediment is first purified by dialysis or washing but not if traces of fumaric acid are added after dialysis. If dialysis is prolonged until dicarboxylic acid is almost completely removed, reduction of methylene-blue takes place only very slowly but rapid reducing power is restored by addition of dicarboxylic acid. Similar results are obtained with O_2 as acceptor although sometimes the process is neither inhibited by addition of malonic acid nor stimulated by that of fumaric acid. Hence the transfer of H to the acceptor is not direct but follows the physiological route by way of the systems oxalacetic acid–malic acid and fumaric acid–succinic acid as in the case of cytochrome reduction. W. McC.

Effect of antiseptics on the lactic dehydrogenase of *Staphylococcus aureus*. D. BACH and J. LAMBERT (Compt. rend. Soc. Biol., 1937, **126**, 298—300).—The substrate exerts a protective action on the enzyme with the majority of antiseptics (including sp. inhibitors of dehydrogenases), except in the case of the coagulating and oxidising inorg. antiseptics. H. G. R.

Effect of antiseptics on the dehydrogenases of *Staphylococcus aureus*. Systems activating glucose, formic acid, and other substrates. D. BACH and J. LAMBERT (Compt. rend. Soc. Biol., 1937, **126**, 300—302).—The selective sensitivity of the enzymes towards different antiseptics can be used for their identification. H. G. R.

Effect of α-ketonic acids on the reduction of methylene-blue. P. E. SIMOLA (Suomen Kem., 1937, **10**, **B**, 20—21).—Suspensions of guinea-pig brain, kidney, and testis reduce methylene-blue more easily in presence of pyruvic acid and (more effective) α-ketoglutaric acid at p_H above 5·5 (optimum is about p_H 8). The effect of lactic acid is as large as that of pyruvic acid, thus indicating that lactic and ketonic acid dehydrogenases have but a small affinity for the substrate. Acetic acid is a weak H donator but its accelerating effect is distinct, especially in presence of pyruvic acid. Acetic and pyruvic acid probably react to give α-ketoglutaric acid. J. L. D.

Action of iodoacetate on dehydrogenases and alcoholic fermentation. M. DIXON (Nature, 1937, **140**, 806).—Many of the 12 dehydrogenases examined are partly inhibited by 0·01M-iodoacetate, but only alcohol dehydrogenase is inhibited at a concn. 0·0003M. The iodoacetate acts on the dehydrogenase itself rather than on the co-enzyme or on any enzyme–co-enzyme complex. This sp. poisoning of the alcohol dehydrogenase provides a possible explanation for the inhibition of alcoholic fermentation in yeast. L. S. T.

Presence of fumarase in seeds of certain Cucurbitaceæ. T. THUNBERG (Skand. Arch. Physiol., 1936, **73**, 67—74; Chem. Zentr., 1936, i, 4171).—Addition of alkali fumarate to seed extracts containing methylene-blue under anaërobic conditions increases the rate of decolorisation of the system. Fumaric acid itself cannot act as H donator but must first be converted into *l*-malic acid, which then in presence of malic dehydrogenase acts as H donator. The seeds contain in some cases the dehydrogenase and in others fumarase. A. G. P.

Action of heavy water on malic dehydrogenase. K. P. JACOBSOHN and M. SOARES (Compt. rend. Soc. Biol., 1937, **126**, 592—595).—The activity of the enzyme is increased by D_2O. H. G. R.

Oxidising enzymes in brain extracts. M. B. COHEN and R. W. GERARD (Amer. J. Physiol., 1937, **119**, 34—47).—Colloidal aq. extract of rabbit brain, the residual tissue removed by centrifuge, and the isoelectric ppt. from the sol at p_H 4·6, redissolved in water, all respire slightly in absence of substrate. The residual tissue when added to the sol exerts a co-enzyme-like action, the resulting O_2 consumption being more than the sum of those of the components. Respiration of the sol is not sensitive to moderate p_H changes. The sol oxidises methylglyoxal, α-glycerophosphate, lactate, fructose, succinate, and *p*-phenylenediamine, the two latter oxidations taking place very rapidly; succinate is oxidised 2—3 times as fast as by intact

brain. Na citrate and oleate inhibit respiration by 30—50%. The oxidation of glucose by brain tissue is inhibited by cytolysis; the lactate-oxidising system is not destroyed, but its components are separated by centrifuge. Residual respiration is stimulated by 0·001M-CN′, but inhibited by 0·01M-CN′. CN′ stimulates oxidation of methylglyoxal partly catalytically and partly by direct action of the enzyme, but inhibits oxidation of succinate and *p*-phenylenediamine, the inhibition in the former case being partly removed by methylene-blue. The residual tissue is still able to oxidise lactate, succinate, and *p*-phenylenediamine. The factor responsible for the co-enzyme effect on the sol is thermostable, and some part of the system is inhibited by urethane. The solution of the isoelectric ppt. contains the systems for oxidation of succinate and *p*-phenylenediamine; the succinate-oxidising power per mg. dry wt. is 6—8 times that of the intact tissue, indicating a partial purification of the enzyme. R. N. C.

Absorption spectrum of catalase. K. G. STERN (J. Biol. Chem., 1937, **121**, 561—572; cf. A., 1937, III, 220).—The spectral absorption of purified liver-catalase solutions has been determined from 400 to 700 mμ. by a recording photoelectric spectrophotometer. Besides the known bands in the visible region, there is a max. of high extinction at 409 mμ., confirming the hæmin nature of catalase. The extinction of catalase is 10·8 and 145 at 622 and 409 mμ., respectively. When referred to 1 mM. of porphyrin-bound Fe per l. the average val. for the ratio k : Fe_P (catalytic activity to content in porphyrin-bound Fe in mg. per l.) of six catalase preps. was 2289±200. J. N. A.

Reaction mechanism of catalase and peroxidase in the light of the theory of chain reactions. J. WEISS (J. Physical Chem., 1937, **41**, 1107—1116).—The different sp. actions of catalase and peroxidase are explained by the greater ease of reduction of the latter, both mechanisms being based on short chain reactions with the radicals OH and HO_2 (cf. A., 1935, 1467). The reaction between $FeSO_4$, KI, and H_2O_2 is studied in detail and the behaviour of $Fe^{\cdot\cdot}$ is correlated with that of the enzymes, which is due to their Fe content. F. R. G.

α- and β-Amylases. J. BLOM, A. BAK, and B. BRAAE (Z. physiol. Chem., 1937, **250**, 104—122).—When the activity of amylase preps. is altered by heating, acidifying, or adsorbing on starch, their starch-liquefying and -saccharifying powers and their power to affect the interaction of starch and I are changed. The parallelism or lack of parallelism in these changes indicates the presence of one or both forms of amylase, no indication of the existence of more than two forms having been obtained. Malt-amylase is a mixture of α-, which has the saccharifying and liquefying properties, and β-amylase which has strong saccharifying but scarcely any liquefying power. α-Amylase also affects the power of starch to react with I. The amylase of *Aspergillus oryzæ* is also a mixture of α- and β-amylase but bacteria and pancreas contain only one form of amylase. W. McC.

Influence of certain factors on the activity of the amylase of *Aspergillus oryzæ*. M. L. CALDWELL and S. E. DOEBBELING (J. Amer. Chem. Soc., 1937, **59**, 1835—1837).—Various amylase preps. show max. amyloclastic action in presence of 0·05M-NaCl at p_H 5, and max. saccharogenic action at p_H 5 in presence of 0·02, 0·05, or 0·1M-NaCl or at p_H 5·3—5·5 in absence of NaCl. H. B.

Arginase. S. EDLBACHER and H. PINOSCH (Verh. schweiz. Physiol., 1937, No. 12, 10—11).—After short exposure at p_H 2—3 liver-arginase can be reactivated by Mn. R. M. M. O.

Lacto-mannitic enzymes. V. Non-fermentability of lactic acid, lactates, and mannitol. V. BOLCATO (Annali Chim. Appl., 1937, **27**, 393—398; cf. A., 1937, III, 69).—The enzymes do not produce acetic acid from lactic acid or lactates, in presence or absence of air, and do not ferment mannitol (cf. Nelson and Werkman, A., 1936, 382). L. A. O'N.

Choline-esterase in the electric organ of the torpedo fish. A. MARNAY (Compt. rend. Soc. Biol., 1937, **126**, 573—574).—The concn. of esterase is 1000 times that found in the aneural portion of frog's sartorius muscle. H. G. R.

Biochemical synthesis of amino-acids. K. JACOBSOHN and M. SOARES (Rev. Chim. pura appl., 1936, [iii], **11**, 220—230).—A review of the evidence for the catalysis by aspartase of the reversible reaction between *l*-aspartic acid, fumaric acid, and NH_3 (cf. A., 1936, 241). F. R. G.

Nucleotide-*N*-ribosidase. Y. KOMITA (J. Biochem. Japan, 1937, **25**, 405—416).—The enzyme (A., 1936, 1556) has $K = 4{\cdot}48 \times 10^{-2}$ (Na guanylate as substrate) and is significantly inhibited by the hydrolytic products, guanine and ribose phosphate. Preps. purified by adsorption on Al_2O_3 and elution with 0·05M-Na_2HPO_4 have optimum p_H 6·5 (crude preps. 7·5) and show a parallel purification in nucleotidase (purine-deaminase) when the latter enzyme [which differs from the ribosidase in requiring inorg. PO_4''' or AsO_4''' for activation] is present. F. O. H.

Preparation and properties of hæmo-digestive enzyme from *Vibrio cholerae*. P. N. BERNARD, J. GUILLERM, and J. GALLUT (Compt. rend. Soc. Biol., 1937, **126**, 303—305).—The enzyme, prepared by pptn. of the culture medium at p_H 5·8 with $(NH_4)_2SO_4$, belongs to the papain group. H. G. R.

Action of the proteinase from *Vibrio cholerae* on natural and denatured protein. P. N. BERNARD, J. GUILLERM, and J. GALLUT (Compt. rend. Soc. Biol., 1937, **126**, 394—395).—The digestion is of the trypsin type characterised by the presence of tryptophan and absence of indole. H. G. R.

Tryptic system of plasma. II. Liberation of active trypsin in plasma. A. SCHMITZ (Z. physiol. Chem., 1937, **250**, 37—46; cf. A., 1937, III, 32).—The system consists of trypsin, a kinase, and an inhibitor of low mol. wt. which probably acts on both kinase and trypsin. The inhibitor is separated from trypsin by treating oxalated plasma with trichloroacetic acid, which ppts. trypsin but not the inhibitor, by adsorbing the inhibitor on Al_2O_3 in presence of

acetic acid, or by ultrafiltration in presence of acetic acid when only the inhibitor passes into the filtrate. W. McC.

Structure of pepsin. D. M. WRINCH (Phil. Mag., 1937, [vii], **24**, 940—953).—The C_2 closed cyclol structure is proposed as the structure of pepsin. The cell dimensions of the crystal *a* 67, *c* 462 A. require 18 mols. of pepsin and 2350 mols. of H_2O per mol. of pepsin. The C_2 structures can be arranged to agree with the crystallographic data. The possible methods of association are discussed. The instability of pepsin crystals on drying implies the presence of megaclusters of H_2O mols. between the layers of pepsin mols. and linking them together. F. J. L.

Peptic activity of hog stomach preparations. F. E. RYMILL and C. A. MACDONALD (Quart. J. Pharm., 1937, **10**, 323—326).—Peptic activity is determined by heating the prep. with caseinogen in dil. HCl to 40° for 1 hr., undigested caseinogen being pptd. with saturated aq. $(NH_4)_2SO_4$ and the turbidity produced compared with that from a standard caseinogen solution. Typical vals. are given for commercial preps. F. O. H.

New method of investigation of specific structure in proteins. E. ABDERHALDEN (Wien. med. Woch., 1936, **86**, 1—3; Chem. Zentr., 1936, i, 4018—4019).—A biological method of step-wise degradation is described. H. N. R.

Chemical nature and mode of formation of pepsin, trypsin, and bacteriophage. J. H. NORTHROP (Science, 1937, **86**, 479—483).—A lecture. L. S. T.

Pectic enzymes. I. Determination of pectin-methoxylase activity. Z. I. KERTESZ (J. Biol. Chem., 1937, **121**, 589—598).—A solution containing pectin, the enzyme, and NaOH is titrated every 5 min. for ½ hr., and the no. of mg. of methoxyl removed during 30 min. divided by the no. of c.c. of enzyme solution used gives the no. of pectin-methoxylase units per c.c. The extent of demethylation varies with the amount of enzyme, and decreases with increase in concn. of pectin. Artificial polygalacturonic acid polymethyl ester is hydrolysed at a rate about 60% of that when pectin is used as substrate. The rate of hydrolysis of α-methyl-*d*-galacturonic acid Me ester is extremely small. J. N. A.

Preparation and properties of purified egg-white lysozyme. E. A. H. ROBERTS (Quart. J. Exp. Physiol., 1937, **27**, 89—98).—Preps. of egg-white lysozyme, of great activity and free from ovomucoid, were prepared from acetone-dried egg-white by fractional pptn. of acid alcohol extracts by acetone. The chemical properties of the active fractions, including those of a series of salts, are described and suggest that it is a protein of low mol. wt. It has antigenic properties. T. S. G. J.

Action of formaldehyde on phosphatases of green leaves. III. P. PRATESI (Annali Chim. Appl., 1937, **27**, 382—386; cf. A., 1937, III, 483).—Formaldehyde does not markedly inhibit the action of the phosphatases from the leaves of *Tropæolum minus*. L. A. O'N.

Nature of organic phosphorus of blood hydrolysed by phosphatases of bone, kidney, and blood. S. E. KERR and A. ANTAKI (J. Biol. Chem., 1937, **121**, 531—538).—Bone and kidney phosphatases in presence of 3·5% trichloroacetic acid at p_H 9 break down adenosine triphosphate in blood filtrates, the greater part of the acid-hydrolysable org. P and of the nucleotide being hydrolysed. Part of the undetermined org. P fraction in pig's blood is also hydrolysed. In laked blood, the acid-hydrolysable P and nucleotide are decomposed by blood-phosphatases in 3 hr. whilst hydrolysis of the diphosphoglycerate fraction is much slower. J. N. A.

Enzymic synthesis of adenosine-5-monophosphoric (muscle-adenylic) acid from adenosine. P. OSTERN and J. TERSZAKOWEĆ (Z. physiol. Chem., 1937, **250**, 155—157).—When adenosine is shaken in presence of toluene at p_H 7 and room temp. for 30 min. with fresh bottom- or acetone-dried yeast and PO_4''' solution, inorg. PO_4''' more than equiv. to adenosine disappears and adenylic acid is produced. The yield of adenylic acid (partly as adenosinetriphosphoric acid) reaches 70%. Since adenine nucleotide from yeast-nucleic acid is hydrolysed by phosphatase, the nucleotide can thus be converted into adenylic acid and adenosinetriphosphoric acid. Guanosine and *d*-ribose are not phosphorylated when treated in the same way as adenosine. The uptake of inorg. PO_4''' by adenosine and the transfer of PO_4''' from adenylic acid (which acts as PO_4''' donator and is subsequently rephosphorylated) are regarded as stages in the glycolysis of yeast. W. McC.

Incorporation of deuterium into growing organisms. V. G. GÜNTHER and K. F. BONHOEFFER (Z. physikal. Chem., 1937, **180**, 185—210; cf. A., 1936, 1026).—Yeast was grown in culture solutions of glucose, mannose, and fructose in heavy water containing approx. 50% D. The D content and the yeast-protein was more than that of whole yeast. H attached to the α-C of amino-acids dissolved in D_2O is fairly readily exchanged for D. The D content of the polysaccharides isolated varied with the hexose present in the culture solution. The more steps there are in a synthesis the greater is the D incorporation. The most direct physiological synthesis of glycogen and the transformation of glucose into glycogen occur via fructose. The synthesis of gum occurs most directly through mannose. In the complete transformation of one hexose into another through the intermediate formation of an enol form, two D atoms may be introduced into each C_6 unit. R. C.

Succinic acid and phosphate in hydrogen activation by yeast. T. THUNBERG (K. fysiogr. Sällsk. Lund. Förh., 1936, **6**, 193—196).—In media containing PO_4''', yeast, and methylene-blue, succinic acid cannot act as a donator anaërobically, but is oxidised under aërobic conditions. In absence of PO_4''', succinic acid acts as a donator. In the absence of PO_4''', sugars exert an inhibitory effect on the decolorisation of methylene-blue by pressed yeast, but stimulate the activity of brewer's yeast. On addition of PO_4''', glucose exerts a stimulatory action on both yeasts. T. S. G. J.

Influence of alkali ions on enzyme reactions in the cell and in solutions. F. FLEISCHMANN and L. SCHWARZ (Protoplasma, 1937, **27**, 552—555).—$Li^{\cdot}$ and $Na^{\cdot}$ activate, whilst $K^{\cdot}$ delays, the decolorisation of methylene-blue by yeast cells. These ions have no such influence in similar experiments with macerated yeast juice. V. B. W.

Significance of iron porphyrins in cellular metabolism. I. Content of iron porphyrin and respiration of various cultured yeasts. H. YOSHIKAWA (J. Biochem. Japan, 1937, **25**, 627—655).—A method of determining the Fe porphyrin content of yeast, by extraction with pyridine and reductive degradation of porphyrin to pyrrole which is determined colorimetrically, is described. The content of Fe porphyrin in yeast is dependent on the Fe content of the culture medium, the high content of porphyrin due to high [Fe] being further increased by presence of limited amounts of Cu. The growth of yeasts in Fe-free media decreases respiration, Pasteur reaction, catalase content, and ability to reduce methylene-blue and increases aërobic CO_2 production as compared with yeasts provided with Fe; with the latter, addition of Cu increases the catalase activity but does not affect the other properties. Yeasts deprived of Fe contain traces of cytochrome-*b* and -*c*, those with Fe greater amounts of -*b* and -*c*, and those with Fe + Cu -*a*, -*b*, and -*c*. F. O. H.

"Styryl 430" and metabolism of glucose in yeast. (A) Effect of phosphate ion and p_H. (B) Changes in the nature of the active glycolytic phase. Y. POURBAIX (Compt. rend. Soc. Biol., 1937, **126**, 448—450, 451—452).—(A) The inhibition of respiration by "styryl 430" increases with increasing acidity (p_H 5—7·6), whilst a high [PO_4'''] prevents this inhibition, probably due to pptn. of "styryl 430."

(B) The fermentation of yeast treated with "styryl 430" is not inhibited by 0·02M-NaF. H. G. R.

Factor stimulating respiration of yeast. J. C. FARDON and M. V. RUDDY (Studies Inst. Divi Thomae, 1937, **1**, 41—51).—The factor capable of stimulating the respiration of yeast cells produced by the action of ultra-violet light on yeast suspensions can be separated from the cells by filtration or centrifuging. The stimulating factor is present in small amounts in the fluid filtered from non-irradiated suspensions of yeast cells and also in Ringer's solution made up with irradiated glucose. S. J. C.

(A) Stimulation of yeast respiration by radiations. (B) Influence of killed cells on the respiration of living cells. J. C. FARDON, M. J. CARROLL, and M. V. RUDDY (Studies Inst. Divi Thomae, 1937, **1**, 17—34, 35—39).—Yeast suspensions exposed to radiation from a Hg arc for 5 min. showed a greatly increased O_2 consumption which persisted for at least 24 hr. Less striking increases in O_2 consumption followed *X*-irradiation for 1 hr. Stimulation of the respiration of fresh yeast cells was obtained when yeast killed either by prolonged ultra-violet irradiation or by autoclaving was added to them. S. J. C.

Some constituents of saké, especially those contained in minute quantities. T. HIGASI (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, **33**, 1—128).—Japanese rice wine, saké, contains 95% of ethyl alcohol + water, 2—3% of acids, glycerol, etc., and 1—2% of a mixture of methylglyoxal, acetal, furfuraldehyde, acetoin, βγ-butylene glycol, diacetyl, methyl ethyl ketone, propyl, amyl, heptyl, nonyl, and phenylethyl alcohol and their esters, vitamin-B_2, pyrazine, sesquiterpene, hydroxyquinol, and a yellow pigment *flazine*, $C_{18}H_{16}O_5N_2$, m.p. 218—220° [*hydrochloride* (+H_2O), m.p. 140° (decomp.)]. The reduction potential curves of flazine and its general properties suggest that it contains a phenazine nucleus. Flazine with $KMnO_4$ in acetone gives $C_{17}H_{12}O_5N_2$, m.p. 210° (decomp.), and with HNO_3, $C_{17}H_{13}O_5N_2{\cdot}NO_2,H_2O$, m.p. >280°. During the work a no. of colour reactions was systematically studied and the types of substance detectable with vanillin–H_2SO_4, nitroprusside–piperidine, $FeSO_4$–KCNS–H_2SO_4, H_2SO_4–HNO_3, etc. were examined. Some of the reactions were used for microdetermination. In addition to saké, other brewing products, *e.g.*, shōchū, vinegar, soy, fusel oil, grape wine, and whisky, were similarly examined. P. W. C.

Utilisation of the optical antipodes of *dl*-tartaric acid by *Aspergillus fumigatus*, Fres. F. GÓRSKI (Bull. Acad. Polonaise, 1937, **B** I, 89—105).—*A. fumigatus* grown on a medium containing 1·2% of *dl*-tartaric acid as C source completely destroys the *d*-form in 3 weeks, the proportion of the *l*-form simultaneously destroyed being below 18% [9·7% when the $(NH_4)_1$ salt is used]. The remainder of the *l*-form is not subsequently destroyed. The proportion of *l*-acid destroyed is not much affected by temp. (20° and 40°) or *dl*-acid concn. (0·6 and 2·4%) or by addition of Mn, U, Ca, or Sr salts, asparagine, gelatin, or peptone, but is reduced by addition of H_3BO_3, $(NH_4)_2MoO_4$, or Na_2MoO_4, by increasing the p_H from 2·7 to 3·5, or by using a nutrient medium of very low N or mineral salt content. The proportion of *l*-acid destroyed is diminished by adding *dl*-malic acid but increased by adding $Fe^{\cdot\cdot}$, $Cu^{\cdot\cdot}$ (oxidation), or *l*-malic acid. No growth occurs when *l*-tartaric acid or *meso*tartaric acid is sole C source. When the C source is *dl*-malic acid, *l*- and *d*-malic acid are destroyed, *l*- the more rapidly. W. McC.

Chemistry of mould tissue. XIII. Monoaminomonocarboxylic and monoaminodicarboxylic acids from *Aspergillus sydowi*. D. W. WOOLLEY and W. H. PETERSON (J. Biol. Chem., 1937, **121**, 507—520; cf. A., 1937, III, 223).—Aspartic and glutamic acids, tyrosine, proline, *iso*leucine, valine, threonine, tryptophan, leucine, and serine have been isolated from an autolysate of mycelium of *A. sydowi*. Relatively large amounts of leucine and serine were isolated. Alanine, phenylalanine, glycine, and hydroxyproline could not be detected. 17·1% of the total N of the mycelium was obtained as definite compounds. J. N. A.

Decomposition of amino-acids by *A. oryzæ*. I, II. Phenylpyruvic acid from *l*-phenylalanine. T. UYEMURA (J. Agric. Chem. Soc. Japan, 1937, **13**, 1146—1152, 1153—1158).—I. Phenylpyruvic acid has been isolated as a decomp. product of *l*-phenylalanine when *A. oryzæ* is grown on a medium contain-

ing glucose (1%), *l*-phenylanaline (1%), and chalk (2%).

II. Thirty strains of *A. oryzæ* produced phenylpyruvic acid from *l*-phenylalanine. J. N. A.

Intake of nitrogen, especially of nitrates by *Aspergillus niger*. D. ITZEROTT (Flora, 1936, **31**, 60—86).—The effect of the p_H of the substrate on the intake of NO_3' by *A. niger* is not dependent on its influence on NO_3' reduction, on the charge on the plasma colloids, or on the permeability of the membrane to HNO_3 mols. The relation between p_H and N assimilation is paralleled by that between N assimilation and accumulation in the cells. At p_H below 3·0 cells take up but cannot utilise NO_3'. With increase in p_H part of the accumulated NO_3' disappears from the cell. Assimilation of $NH_4^{\cdot}$ increases with rising p_H, but is not entirely inhibited under acid conditions. A. G. P.

Dyestuff- and nitrate-intake by *Aspergillus niger*. E. BÜNNING (Flora, 1936, **31**, 87—112).—The effect of p_H on ionic intake by the mould is not attributable to its influence on the electric charge on the cell surface or on the permeability of the membrane. The rate of intake of dyes is regulated by their concn. within the cell. The latter is conditioned by the adsorptive power of the colloids of the cell sap, and this, in turn, by the p_H of the substrate, diminution of $[H^{\cdot}]$ tending to increase the concn. of basic and decrease that of acid dyes in the cell contents. $Ca^{\cdot\cdot}$ and $Al^{\cdot\cdot\cdot}$ inhibit the intake of basic dyes. Accumulation of dye anions and of NO_3' occurs when the p_H of the medium is below 2·5—3·0, and that of dye cations when p_H is above 3·0. In media of p_H 2·5—3·0, the reaction of the cell sap lies in the p_H range 4·2—5·0. A. G. P.

Effect of the nature of the culture medium on the production of lysins by *Actinomyces*. M. WELSCH (Compt. rend. Soc. Biol., 1937, **126**, 244—246).—The formation of the lysin is intimately connected with sporulation. The max. yield is obtained by diluting the medium prior to filtration on a Chamberland filter. H. G. R.

Properties of the bacteriolytic principle of *Actinomyces*. M. WELSCH (Compt. rend. Soc. Biol., 1937, **126**, 247—249).—The lysin is of protein nature and is more stable in alkaline than in acid solution. H. G. R.

Nutrition of *Achyla bisexualis* and *Saprolegnia ferax*. F. T. WOLF (Amer. J. Bot., 1937, **24**, 119—123).—In the hydrolysis of peptone by these fungi NH_3 is produced. Both organisms oxidise fats. α-Naphthylacetic acid (1 p.p.m.) inhibits growth of the fungi by protoplasmic injury, the effect being independent of the rate of utilisation of peptone and sugars. A. G. P.

Relation of oxygen pressure and temperature to growth and carbon dioxide production in *Polystictus versicolor*. T. C. SCHEFFER and B. E. LIVINGSTONE (Amer. J. Bot., 1937, **24**, 109—119).—The relative growth of mycelium under varying conditions of temp. and partial pressure of O_2 is recorded. Decay of wood is increased by aëration provided the water content is adequate to maintain the growth of the fungus. The optimum temp. for decay is probably higher than the optimum and lower than the max. for mycelial development. Destruction of wood is least rapid in proportion to the spread of mycelium when the O_2 pressure is relatively low and the temp. is below optimum for growth. A. G. P.

Fruiting of *Physarum polycephalum* in relation to nutrition. W. G. CAMP (Amer. J. Bot., 1937, **24**, 300—303).—Plasmodia continued to grow in rolled-oat cultures as long as the nutrient supply was sufficient; when this was exhausted fruiting began. A. G. P.

Influence of certain external factors on spore germination in *Myxomycetes*. R. F. SMART (Amer. J. Bot., 1937, **24**, 145—159).—Germination of the spores was favoured by the presence of decoctions of natural substrates (rotting wood, leaves, humus). This range of p_H within which germination occurs is recorded for many species, the optimum for all species being between p_H 4·5 and 7·0. A. G. P.

Organic nutrition of the flagellate *Polytoma uvella*. L. PROVASOLI (Compt. rend. Soc. Biol., 1937, **126**, 280—282).—Acetic, butyric, valeric, *n*- and *iso*-hexoic, and pyruvic, but not propionic, *iso*-butyric, *iso*valeric, heptoic, and lactic acids, are utilised. H. G. R.

Starchy material elaborated by the flagellate *Polytoma obtusum*. P. BRÉCHOT (Compt. rend. Soc. Biol., 1937, **126**, 555—556).—The starchy material, prep. from old cultures or from young cultures killed by heat, gives a violet coloration with I, which is lost on amylase digestion with the formation of a reducing substance, but maltose was not detected. Glucose is yielded by acid hydrolysis of the organism. H. G. R.

Action of the lower fatty acids and their α-hydroxy-derivatives on *Entamœba histolytica*. L. BIRCH-HIRSCHFELD (Z. Hyg., 1936, **119**, 91—102).—Acetic, propionic, and butyric acid penetrate into the cell almost instantaneously, causing swelling of the cytoplasm, increase in density of the nuclear substance, and finally coagulation. Glycollic, lactic, and α-hydroxybutyric acids penetrate more slowly, but not as slowly as HCl and phosphate solutions, which produce no swelling. In spite of their slower penetration the hydroxy- acids are more toxic than the first three. Toxicity appears to be related to degree of dissociation, and is greater in acid than in alkaline solutions. M. A. B.

Apparatus for determination of spore-destruction rates [of bacteria]. C. C. WILLIAMS, C. M. MERRILL, and E. J. CAMERON (Food. Res., 1937, **2**, 369—375). E. C. S.

Cellulose-decomposing myxobacteria. H. KRZEMIENIEWSKI and S. KRZEMIENIEWSKI (Bull. Acad. Polonaise, 1937, **B** I, 11—31).—Various strains of *Sorangium* and *Archangium*, capable of decomposing up to approx. 80% of added cellulose, are described. W. McC.

Degradation of cellulose by myxobacteria. H. KRZEMIENIEWSKI and S. KRZEMIENIEWSKI (Bull. Acad. Polonaise, 1937, **B** I, 33—59).—*Sorangium*

compositum and *S. nigrescens* grow normally on cellulose as sole C source in presence or, if NO_3' is present, in absence of O_2, the optimal temp., and p_H being 34—35° (no growth below 11° or above 40°) and 6·5—8·5, respectively. Cellulose is the best C source, but other carbohydrates (not sucrose, inulin, mannitol, or dulcitol) are utilised to varying degrees. The best N sources are NO_3' (which is reduced) and NH_4 salts, N of org. material being scarcely utilised. The products of degradation of cellulose by the organisms are fat-like substances, glycogen, volutin, and mucous substances. The organisms contain pigments (probably carotenoid) and substances which give colours with H_2SO_4. W. McC.

Nitrogen-fixation by excised root nodules. A. I. VIRTANEN and T. LAINE (Suomen Kem., 1937, **10**, **B**, 24).—Excised pea-root nodules grown in sand fix atm. N_2 in nutrient solutions containing oxalacetic acid. J. L. D.

Synthetic soil as a medium for the study of certain microbiological processes. M. R. MADHOK (Soil Sci., 1937, **44**, 319—322).—Sand–bentonite mixtures were superior to sand alone for the development of cellulose-decomposing and NO_2'-forming bacteria, but was less suitable for nitrifying organisms and those effecting aërobic fixation of N. Supplementary additions of humus were non-effective. A. G. P.

Physiology of parasitism. XV. Effect of the nutrient medium on the secretion and properties of pectinase. M. FERNANDO (Ann. Bot., 1937, **1**, 727—745; cf. A., 1934, 337).—The optimum p_H for the pectinase of *B. carotovorus* varied somewhat with the nature of the medium into which it was secreted. In media in which the growth of the organism tends to produce acidity, the optimum p_H of the enzyme also drifts towards the acid side. Prolonged exposure to acid conditions tends to lower the optimum p_H of the pectinase. Production of active enzyme solutions by *B. carotovorus* is associated with conditions favouring rapid multiplication of the organism. On the basis of equal growth, cultures produce pectinase more freely under alkaline than under acid conditions. The C/N ratio of the medium affects enzyme production only by influencing the p_H, high ratios being associated with low p_H. A. G. P.

Butyl alcohol–*iso*propyl alcohol fermentation. O. L. OSBURN, R. W. BROWN, and C. H. WERKMAN (J. Biol. Chem., 1937, **121**, 685—695; cf. B., 1935, 604).—The normal end products of fermentation of glucose by *Clostridium butylicum* (Beijerinck), Donker, are butyl and *iso*propyl alcohol, CO_2, H_2, and small amounts of acetic and *n*-butyric acids. In presence of $NaHCO_3$, the formation of the alcohols is almost entirely suppressed, the effect being more pronounced with *iso*propyl alcohol than with butyl alcohol. Formic, acetic, butyric, pyruvic, and lactic acid accumulated when large amounts of $NaHCO_3$ are present; methylglyoxal was also formed. J. N. A.

Formation of acetylmethylcarbinol and βγ-butylene glycol by bacteria. III. Isolation of acetylmethylcarbinol (acetoin). Y. TOMIYASU (J. Agric. Chem. Soc. Japan, 1937, **13**, 1045—1049).—Acetoin has been obtained from the products of fermentation of glucose by *B. lactis aërogenes*. J. N. A.

Rôle of fumarate in respiration of *B. coli commune*. H. A. KREBS (Biochem. J., 1937, **31**, 2095—2124).—Fumarate, pyruvate, oxalacetate, and probably CO_2 act as respiratory catalysts (H carriers) in *B. coli*. Methods for studying intermediary transport of H by carriers are described. Fumarate oxidises, anaërobically, glucose, malate, lactate, acetate, glycerol, *dl*-glyceraldehyde, butyrate, pyruvate, *l*-(+)glutamic acid, and H_2. Formate is oxidised only when the cells contain active hydrogenylase. The rates of oxidation of these substances by fumarate and O_2 are compared. Pyruvate acts as H carrier only in acid medium, yielding large amounts of lactate and CO_2. Oxalacetate is readily fermented by *B. coli*, about 50% being reduced to succinic acid and the remainder being oxidised. Many oxidations are primarily dismutations in which the elements of water react, H being accepted by the carrier, and O by the org. mol. Such are the oxidations of pyruvate and acetate. The decomp. of formate into H_2 and HCO_3' is also a dismutation. Fumarate when fermented yields succinic acid, CO_2, and HCO_3'. It catalyses the fermentation of pyruvate. H_2 is absorbed in presence of oxalacetate, but probably only after primary reduction to fumarate. Pyruvate does not react with H_2. The reaction between H_2 and fumarate is inhibited by O_2. The rates of formation of succinic acid from hexoses, pyruvate, glycerol, and glyceraldehyde are highest in presence of glucose and mannose, whilst the yield is higher in presence of galactose and glycerol. The acid formed anaërobically by washed cells is mainly succinic acid, for determination of which a modification of Szent-Györgyi's method (A., 1935, 1406) is described. J. N. A.

Biochemical degradation of histidine. Existence of ammoniacases. A. DA CRUZ (Compt. rend. Soc. Biol., 1937, **126**, 590—592).—No evidence was obtained for the presence of an ammoniacase in the decomp. of histidine by *B. coli communis*. H. G. R.

Salt limits and thermal stability of a new species of anaërobic halophile. J. G. BAUMGARTNER (Food Res., 1937, **2**, 321—329).—The organism, *Bacteriodes halosmophilus* n. sp., is an obligate anaërobe isolated from the muscle of Mediterranean salt anchovies and the solar salt in which they are packed. Growth is max. in 12½—15% aq. NaCl and does not occur in below 4%. Na is replaceable by K, Li, Mg, or Ca, the concns. of which required for max. growth decrease in the order named. The resistance to heat is greatest at that [NaCl] which allows max. growth, and is least at the min. [NaCl] allowing growth. E. C. S.

Dehydrogenating properties of micrococci and streptococci. O. EHRISMANN (Z. Hyg., 1937, **119**, 572—612).—Using the methylene-blue technique, 67 different substrates, which included acids, alcohols, aldehydes, carbohydrates, NH_2-acids, and amides, were studied, using *M. pyogenes aureus*, *M. albus*, *M. tetragenus*, *M. candicans*, and *Streptococcus pyogenes*. The effects of concn. of bacterial cells

(*i.e.*, concn. of enzymes), concn. of H donators and acceptors, p_H, temp., and age of culture on the rate of dehydrogenation were determined. The dehydrogenating properties are in general comparable with those of *B. coli*. Micrococci contained the most active enzymes, and attacked more substrates than did streptococci. HCN, NaF, and bromoacetic acid were inhibitors; the last inhibited dehydrogenation of NH_2-acids. Micrococci in presence of Na lactate as H donator dehydrogenated $NaNO_3$ and fumaric and malic acids, whilst asparagine and pyruvic acid were unattacked. Other oxidation-reduction indicators were compared with methylene-blue in presence of lactate or succinate. J. N. A.

Utilisation of amino-acids by streptococci. O. EHRISMANN and K. DRAMBURG (Z. Hyg., 1937, **119**, 623—634).—Glycine, alanine, leucine, asparagine, glutamic acid, tryptophan, tyrosine, and cystine have no effect on rate of growth of *Streptococcus pyogenes* in dil. aq. peptone containing glucose. Deamination by "resting" streptococci is slight, whilst *B. coli* are strongly deaminating. Amino-acids can be dehydrogenated by streptococci in presence of methylene-blue. The O_2 consumption is increased in presence of amino-acids. HCN is an inhibitor. Redox dyes have practically no inhibitory action on respiration, except in high concn. J. N. A.

Isolation and cultural differentiation of food-poisoning staphylococci. G. H. CHAPMAN, C. W. LIEB, and L. G. CURCIO (Food Res., 1937, **2**, 349—367).—The procedure for isolation and preliminary differentiation is outlined. Typical food-poisoning staphylococci produce yellow or orange pigment, hæmolyse rabbit-blood agar, coagulate human and rabbit plasma, produce orange or deep violet growths on crystal-violet agar, grow luxuriantly on bromothymol-blue agar, and ferment mannitol. Loss of any one of these characters indicates degeneration, of which the hæmolysis test is the best indication. The val. and limitations of the Stone test are discussed. E. C. S.

Plasma-coagulating properties of staphylococci. M. FISHER (Bull. Johns Hopkins Hosp., 1936, **59**, 393—414).—Of 34 strains of *Staphylococcus* from various sources, 26 clotted plasma and 17 clotted fibrinogen. 30 additional strains of *S. aureus* of human origin all clotted plasma. Of these all but 1 were hæmolytic from pathological lesions. The bacteria-free broth culture filtrates exhibited similar properties and the active material could be pptd. by alcohol and then dissolved in saline. It is concluded that the plasma clotting is a trustworthy sign of pathogenicity. Attempts to reproduce this blood clotting *in vivo* by intravenous and intrapleural injections into rabbits were unsuccessful. T. F. D.

Lipins of tubercle bacilli. LI. Firmly bound lipins of human tubercle bacillus. R. J. ANDERSON, R. E. REEVES, and F. H. STODOLA. **LII. Acetone-soluble fat of *B. lepræ*.** R. J. ANDERSON, R. E. REEVES, and J. A. CROWDER (J. Biol. Chem., 1937, **121**, 649—668, 669—684; cf. A., 1937, III, 358).—LI. The bound lipins of two strains of tubercle bacillus, extracted after treatment with acidified ether–alcohol, consist mainly of a hydroxy-acid of high mol. wt. previously called "unsaponifiable wax," together with small amounts of tuberculostearic acid and lower fatty acids. Phthioic acid, phthiocol, and phthiocerol are not present. A *polysaccharide*, m.p. 205—210°, $[\alpha]_D^{25}$ +30° in H_2O, containing N and P, was also obtained; hydrolysis gave mannose, *d*-arabinose, and *d*-galactose. The lipins are present in the cell combined with either a protein or carbohydrate, probably the latter.

LII. The acetone-sol. fat of *B. lepræ* consists of a mixture of free fatty acids and neutral fat. The latter consists of esters of trehalose. No glycerol is present. The ordinary saturated fatty acids present are hexoic, myristic, palmitic, stearic, arachidic, behenic, and tetracosanoic acids. Certain new optically active higher acids are present, but could not be identified. The unsaturated acids include C_{14}, C_{16}, C_{18}, C_{20}, C_{22}, and possibly C_{21} and C_{25} acids. A series of new dextrorotatory, branched-chain, saturated acids, which approximate to $C_{16}H_{32}O_2$, $C_{19}H_{38}O_2$, and $C_{22}H_{44}O_2$, are isolated. Three phenolic substances are present, one of which, $C_{14}H_{22}O_3$, m.p. 105—106°, contains 2 OH. J. N. A.

Physiology of sulphur-storing and sulphur-free purple bacteria. W. BAVENDAMM (Ergebn. Biol., 1936, **13**, 1—53).

p_H of cultures of *B. tuberculosis*. A. CARVALHO and C. VIDAL (Compt. rend. Soc. Biol., 1937, **126**, 588—589).—The changes in p_H during the culture of *B. tuberculosis* on different media cannot be correlated. H. G. R.

Preservation of the toxigenic properties of the diphtheria bacillus. M. PHILIPPE (Compt. rend. Soc. Biol., 1937, **126**, 170—171).—The toxigenic properties can be conserved if air supply to the culture is limited by a layer of paraffin ("hypoxybiosis"). H. G. R.

Hæmo-digestive enzyme of the cholera vibrio. P. N. BERNARD, J. GUILLERM, and J. GALLUT (Compt. rend. Soc. Biol., 1937, **126**, 180—182).—The enzyme may be extracted from the medium on which the organism has grown, but not from the organism. H. G. R.

Action of the proteinase of the cholera vibrio on the same vibrio. P. N. BERNARD, J. GUILLERM, and J. GALLUT (Compt. rend. Soc. Biol., 1937, **126**, 478—480).—The proteinase digests the protein of the vibrio heated to 100° or that heated to 56° in faintly alkaline medium. Partial digestion of the living organism occurs in slightly acid medium. H. G. R.

Action of a proteinase from the cholera vibrio on erythrocytes. P. N. BERNARD, J. GUILLERM, and J. GALLUT (Compt. rend. Soc. Biol., 1937, **126**, 568—570).—The enzyme has a hæmodigestive action on erythrocytes in suspension in saline or incorporated with gelose. H. G. R.

Course of p_H changes during the fermentation of carbohydrates by cholera and El Tor vibrios. H. GROSSMANN (Z. Hyg., 1937, **119**, 225—232).—Decomp. of glucose and mannitol by the El Tor vibrio is accompanied by changes in p_H, which after an initial period of acidity maintains a consistently higher level than that produced by cholera vibrios.

Use of this in the differentiation of the two species is discussed. A. G. P.

Characteristic long-chain growth of pneumococci due to quaternary ammonium salts, especially choline. Differentiation of pneumococci and streptococci. H. OKAMOTO and T. SHAKO (Japan. J. Med. Sci., 1937, IV, **10**, 129—160).—*Pneumococcus* grown for 24 hr. in media containing choline forms long chains. Types I and III react more strongly than II. *Streptococcus hæmolyticus*, *S. anhæmolyticus*, and *Staphylococcus aureus* react negatively, and *S. viridans* positively, with choline in blood agar but negatively with choline in broth. Other quaternary NH_4 compounds produce long-chain pneumococci but tertiary compounds are less active and secondary and primary inactive. R. M. W.

(A) Lactose-fermenting *Salmonella* variant. (B) *S. bredeney*, and the antigen table. P. KAUFFMANN (Z. Hyg., 1937, **119**, 352—355, 356—368).—(A) The lactose-fermenting variant decomposes salicin more rapidly (and without gas formation) than does the normal type.

(B) Serological reactions are examined. A. G. P.

Zone of activity of ultra-violet rays on bacteria. R. O. PRUDHOMME (Compt. rend. Soc. Biol., 1937, **126**, 289—291).—The lethal action on staphylococci and *B. coli* occurs between 2300 and 3000 A., the max. activity occurring in the 2650, 2800, and 2530 A. bands. H. G. R.

Sterilising action of acids. X. Action of aldehydo- and ketonic fatty acids. Action of aconitic acid. S. TETSUMOTO (J. Agric. Chem. Soc. Japan, 1937, **13**, 1159—1164; cf. A., 1937, III, 359).—The action of aldehydo- and keto-acids is greater than that of monobasic fatty acids with same no. of C. The salts and the anions have no action. At the same concn. the action of pyruvic acid is much greater than that of lævulic acid. Aconitic acid has the least action amongst unsaturated acids below C_6. The anion and salts of aconitic acid have no action, the salts tending to increase the survival of micro-organisms. J. N. A.

Antibacterial action of saliva on capsule-bearing bacteria. M. PRICA (Z. Hyg., 1937, **119**, 306—321).—Fresh saliva *in vitro* does not inhibit the growth of *B. rhinoscleromatis*, *B. Friedländer*, or *B. ozænæ* but causes the development of non-capsulated variants. Incorporation of saliva in agar media inhibited the growth of colonies. The activity of saliva was destroyed by heating and removed by passage through a Seitz filter or by shaking with animal C. In centrifuged saliva the active matter is confined to the sediment. The inhibitory action of saliva is dependent on the antagonistic effect of saliva bacteria. A. G. P.

Recent chemotherapeutic applications of the 4-aminoquinoline series. H. IENSCH (Angew. Chem., 1937, **50**, 891—895).—The bactericidal and trypanocidal activities of members of the series are discussed. F. O. H.

Phenomenon of the halo and synergy in bacteriophages. A. GRATIA (Compt. rend. Soc. Biol., 1937, **126**, 418—421).—The halo phenomenon is only obtained with lysinogenic bacteriophages and lysino sensitive bacteria, the latter being the mucous iridescent strains. An iridescent strain can be obtained from bacteria in the halo but these do not exhibit the phenomenon. H. G. R.

Nutritive media from fish products. I, II. W. HACH and N. POLULACH (Arch. Sci. biol., U.S.S.R., 1936, **41**, 163—165).—The products of the auto-digestion of the stomach-wall of the cod, haddock, pollack, sea-wolf, and polar shark provide media for the growth of bacteria similar to the ordinary peptone medium. Growth and morphology are in no way different, except for those of certain delicate pathogenic bacteria. C. A. A.

Filterable viruses as disease producers in man, animals, and plants. K. HERZBERG (Klin. Woch., 1936, **15**, 1665—1669).—A review. F. W. L.

Filterable virus productive of disease in men, animals, and plants. O. WALDMANN (Klin. Woch. 1936, **15**, 1705—1710).—A review. F. W. L.

General characteristics of viruses including bacteriophage. R. DOERR (Z. Hyg., 1936, **118**, 738—747).—Work mainly suggesting that viruses are non-living, chemical substances is reviewed. M. A. B.

Effect of physical and chemical agents on the neurolymphophile virus. M. PETZETAKIS (Compt. rend. Soc. Biol., 1937, **126**, 412—414).—The virus is sensitive to heat, desiccation, and antiseptics and is not stable in glycerol or bile. H. G. R.

Highly purified virus of foot and mouth disease. L. W. JANSSEN (Z. Hyg., 1937, **119**, 558—571; cf. Pyl, A., 1932, 431).—The solution of the virus in saturated $CaSO_4$ is treated at 0° with 10—20% of alcohol or 25—36% alcohol–either (7 : 3). The virus is adsorbed on the pptd. $CaSO_4$ and can be eluted with saturated aq. $CaSO_4$, Na_2HPO_4, or $(NH_4)_2C_2O_4$. Pptn. of the virus from 0·2% $MgSO_4$ by alcohol gives a reversibly sol. form, whilst pptn. with glycerol–alcohol–ether gives an insol. active form which can be used for inoculation. J. N. A.

Mosaic disease of tobacco. Action of proteoclastic enzymes on the virus fraction. Nature of the virus from various species of plants. A. F. ROSS and C. G. VINSON (Missouri Agric Exp. Sta. Res. Bull., 1937, No. 258, 19 pp.).—Pepsin inactivates the virus at p_H 3, causing a gradual diminution in infectivity. Inactivation probably results from adsorption rather than from the action of the enzyme on the host. Purified preps. of the virus contained 16% of N and 1% of ash (dry matter basis). Among virus preps. from a no. of plant species infectivity was correlated with N content. A. G. P.

Accuracy in determination of the activity of tobacco mosaic virus protein. H. S. LORING (J. Biol. Chem., 1937, **121**, 637—647).—The most favourable concn. for comparison of different samples of cryst. virus protein is about 1 μg. per c.c. Differences in concn. of 10% can be readily detected by the half-leaf method on *Phaseolus vulgaris* when 40 to 50 leaves are used. With *Nicotiana glutinosa* the smallest detectable difference in concn. is 20%. J. N. A.

Ultra-centrifuging of plant virus. A. GRATIA and P. MANIL (Compt. rend. Soc. Biol., 1937, **126**, 423—425).—A rapid method for prep. of Stanley's crystals from the plants infected with mosaic disease of tobacco has been developed, using Bawden's method in conjunction with the ultra-centrifuge of Henriot and Huguenard. No trace of the crystals could be obtained from *Nicotiana glutinosa* where the infection is localised. H. G. R.

Immunological reactions of the filterable viruses. F. M. BURNET, E. V. KEOGH, and D. LUSH (Austral. J. Exp. Biol., 1937, **15**, 231—368).—In this monograph the general nature of virus and bacteriophages, and modern views on the antigen–antibody reaction, are discussed. The immunological reactions of bacteriophages are described. The animal viruses dealt with include *Vaccinia*, influenza, louping-ill, Rift-Valley fever, equine encephalomyelitis, Newcastle disease, infectious laryngotracheitis of fowls, and myxomatosis of rabbits. A short account is given of the study of plant viruses by immunological method. Other questions discussed are virus immunity from a biological point of view, the site of formation of virus antibodies, and the principles of active immunisation against virus infections. D. M. N.

Serological study of the capsular and somatic antigens of the anthrax bacillus by flocculation and fixation of the complement reactions. W. SCHAEFFER and G. SANDOR (Compt. rend. Soc. Biol., 1937, **126**, 187—189).—The activity of the capsular is greater than that of the somatic antigen and they are sp. The flocculation reaction for the capsular antigen is inhibited by either a large excess of antiserum or of capsular antigen but the reaction for somatic antigen is inhibited only by an excess of somatic antigen. H. G. R.

Chemical nature of the diphtheria toxin and anatoxin. A. BOIVIN (Compt. rend. Soc. Biol., 1937, **126**, 218—221).—The activities of the purified toxin (Eaton, A., 1937, III, 226) and anatoxin (*ibid.*, 86) are identical and both appear to be proteins in a state of purity. H. G. R.

Rôle of certain constituents of yeast extract favourable to the production of diphtheria toxin. A. MUSTAFA (Compt. rend. Soc. Biol., 1937, **126**, 558—560).—In addition to vitamin-B_1 other factors, at present unknown, are concerned (cf. A., 1937, III, 319). H. G. R.

Effect of acetylation by keten on the antigenic and anaphylactogenic properties of the proteins of antidiphtheria serum. H. GOLDIE and G. SANDOR (Compt. rend. Soc. Biol., 1937, **126**, 291—295).—The serum retains its antigenic power, although the anaphylactogenic power is destroyed, the NH_2-groups are acetylated, and resistance to dialysis and heat is acquired. H. G. R.

Ultra-violet spectrophotometry of biologic fluids. I. Blood-plasma following immunisation to α-crystalline lens protein. II. Tetanus and diphtheria antitoxic serum. F. L. DUNN and A. T. SUDMAN (Arch. Path., 1937, **24**, 454—457).—The ultra-violet absorption of blood-plasma in the rabbit immunised with α-cryst. lens protein does not deviate significantly from the normal. The ultra-violet absorption of diphtheria and tetanus antitoxic serum resembles closely that reported for serum-globulin. C. J. C. B.

Parallelism between certain chemical changes (acetylation of the amino-groups) in antidiphtheria serum and modification in the physico-chemical (resistance to dialysis and heat) and biological (antitoxic and anaphylactogenic) properties. G. SANDOR and H. GOLDIE (Compt. rend. Soc. Biol., 1937, **126**, 295—298).—Max. destruction of the anaphylactogenic power and modification of the physico-chemical properties correspond with acetylation of 25—30% of the NH_2-groups. The antitoxic power is practically unaffected at this val. but disappears rapidly with further action. A new antigenic power is produced during the acetylation (sensitising guinea-pigs against the acetylated serum) without the total disappearance of the original antigen. H. G. R.

Toxins of the dysentery bacillus. Identity of the thermolabile, neurotropic toxin of the organism of the bacillus of Shiga and the exotoxin present in the filtrates from broth cultures of the same organism. A. BOIVIN and L. MESROBEANU (Compt. rend. Soc. Biol., 1937, **126**, 323—325).—The neurotropic toxin of the *R* and *S* forms of Shiga's bacillus (A., 1937, III, 338) is identical with that obtained from broth cultures (*ibid.*, 116), the protein which is the exotoxin of the latter being a constituent of the organism. H. G. R.

Production of specific agglutinins in the blood and cerebrospinal fluid of rabbits after intravenous injection of *B. paratyphosus*. B. P. NÉLIS (Compt. rend. Soc. Biol., 1937, **126**, 172—174). H. G. R.

Chemo-immunological studies on the soluble specific substance of *Pneumococcus*. III. Structure of the aldobionic acid from the type III polysaccharide. R. D. HOTCHKISS and W. F. GOEBEL (J. Biol. Chem., 1937, **121**, 195—203; cf. A., 1935, 1168).—The aldobionic acid from sp. polysaccharides of types III and VIII *Pneumococcus* is glucose-4-β-glycuronide, the similarity of which to cellobiose suggests a close relationship of the polysaccharides to cellulose. P. G. M.

Effect of oxygen injected subcutaneously on antibody formation. G. P. YOUMANS and T. SIMPSON (Arch. Int. Med., 1937, **60**, 574—581).—Daily subcutaneous injections of 30 c.c. of O_2 per kg. body wt. into dogs and rabbits previously injected with heat-killed pneumococci of types I and II had no effect on the opsonin or agglutinin titres of the sera. A. L.

Alexin and the anticomplementary power [of guinea-pig serum]. J. DUFOUR (Compt. rend. Soc. Biol., 1937, **126**, 498—500).—No direct relationship exists between the development of the anticomplementary power and disappearance of alexin on heating. H. G. R.

Serum-proteins. I. Identification of a single serum-globulin by immunological means. Its distribution in the sera of normal individuals

and of patients with cirrhosis of the liver and with chronic glomerulonephritis. F. E. KENDALL (J. clin. Invest., 1937, **16**, 921—931).—By using different globulin fractions obtained from human serum, and preparing immune antisera by injecting rabbits with the different fractions, ordinary globulin could be divided up into a fraction α-globulin, which behaved as a pure protein in its reaction to immune rabbit serum, and another fraction, globulin-*X*, which contained more than one antigen. Normal human serum contained 1·1—2·1 g. α-globulin and 0·4—1·0 g. of globulin-*X* per 100 c.c. In the serum of 13 cases of alcoholic cirrhosis of the liver, the increase in globulin was due to an increase in α-globulin. In seven cases of chronic glomerulonephritis in the nephrotic stage, the α-globulin was decreased, while the globulin-*X* was usually increased. C. J. C. B.

Changes in protein and residual nitrogen content of normal and immune sera under the action of living bacteria. T. WOHLFEIL (Z. Hyg., 1936, **119**, 119—134).—*B. proteus* effects considerable decomp. of serum-protein, the residual N increasing to an approx. const. val. after 3 days. The organism probably utilises part of the residual N during the period of active increase. *B. anthracis* and *V. choleræ* produce a similar increase in residual N without, and *C. diphtheriæ* with, activation by Na phosphates. The inhibitory action of immune sera on bacterial autolysis and on the activity of cellular protease towards serum-protein is sp. and greater than that of normal sera. The proteolytic activity of living bacteria, unlike that of immune sera, is increased by Na phosphate. M. A. B.

Suitability of phenol for the production of bacteria-free smallpox vaccine. W. LEHMANN (Z. Hyg., 1936, **119**, 20—27). M. A. B.

Antigenic substance as contamination in phospholipin. S. FUJIMURA (J. Biochem. Japan, 1937, **25**, 595—606).—The antigenic principle in crude lecithin preps. occurs in the water- but not the chloroform-sol. portion; the aq. extract contains protein substances totally or partly consisting of ovovitellin (cf. Kimizuka, A., 1935, 375). F. O. H.

Action of ultra-violet irradiation on serum antigens. T. KNEPPER (Klin. Woch., 1937, **16**, 352).—Two series of rabbits were treated with pig and horse sera. In one the sera were not previously irradiated. After this sensitisation the injection of irradiated sera did not produce anaphylactic shock. In the other series previous sensitisation with irradiated sera rendered the animals anaphylactic to injections of the corresponding irradiated sera. F. W. L.

Effect of stroma-protein on production of hæmolysin. N. SHIMAZONO (J. Biochem. Japan, 1937, **25**, 691—699).—The hæmolysin- and agglutinin-inducing action of erythrocyte stroma (ox) depends on the antigenic properties of the protein constituent and is not influenced by the lipin constituent. F. O. H.

Antigenic properties of *Vipera aspis* venom detoxicated with sodium ricinoleate. E. CÉSARI and P. BOQUET (Compt. rend. Soc. Biol., 1937, **126**, 570—572).—Methods are described for preparing an anti-venom serum using the detoxicated (A., 1937, III, 251) or the untreated venom. H. G. R.

Localisation of the agglutinin in the viscous protein. P. G. CHARPENTIER, M. DOLADILHE, C. MOREL, and N. PLACIDI (Compt. rend. Soc. Biol., 1937, **126**, 557—558).—The viscous protein (A., 1937, III, 166) is the only constituent of the blood serum acting as an agglutinin. H. G. R.

Extinctiometric investigation of precipitin reaction. E. A. BOASSON (Acta. brev. neerl. Physiol., 1937, **7**, 5—9).—The combination of antigen and antibody has been measured turbidimetrically. This combination is decreased by increasing dilution. T. F. D.

Ecological and chemical analysis of the halophyte problem. A. ARNOLD (Jahrb. wiss. Bot., 1936, **83**, 105—132).—The distribution of plant species is examined in relation to [NaCl] in the ground-water in salt-marsh soils. The NaCl content of leaves increases with the [NaCl] of the ground-water in some but not in all species. A. G. P.

Pure cultures of algæ from soil. J. K. WILSON (Proc. Soil Sci. Soc. Amer., 1937, **1**, 211—212).—A method of preparation is described. A. M.

Germination and seedling production of *Arctostaphylos uva-ursi*. J. GIERSBACH (Contr. Boyce Thompson Inst., 1937, **9**, 71—78).—The stony fruits of *A. uva-ursi* fail to germinate readily because of a hard coat and a dormant embryo. The hard coat effect may be removed by treatment with H_2SO_4 followed by placing in moist granulated peat moss for a period at 25°. After the coat problem is solved, low temp. is needed to overcome the dormancy of the embryo. L. V. B.

Germination and seedling production of species of *Viburnum*. J. GIERSBACH (Contr. Boyce Thompson Inst., 1937, **9**, 79—90).—*Viburnum* species, except southern forms, required const. temp. of 20° or a daily alternating temp. of 20—30° for root production (germination) followed by a low-temp. pre-treatment for shoot production (seedling production). The rate of germination and the effective temp. range varied for different species. L. V. B.

Factors affecting germination and growth of gentian. J. GIERSBACH (Contr. Boyce Thompson Inst., 1937, **9**, 91—103).—Pre-treatment in a moist medium for 2 months at 1° or 3° effected germination of *G. crinita*. Further growth and development of the seedlings depended on the kind of soil and the temp. Seeds of *G. crinita* stored in open containers at room temp. and 5° showed complete loss of vitality after one year. Seeds sealed in air at room temp. also lost their vitality in this time whilst those sealed in partial vac. at room temp. and those sealed with air and partial vac. at 5° still retained their original germinating power. Germination of *G. andrewsii* was favoured by light as well as pre-treatment at low temp. Seeds of *G. acaulis* were entirely dependent on low-temp. pre-treatment for germination or seedling production. Two months at 1° or 3° was effective. L. V. B.

Relation between water- and assimilation-economy [in plants]. O. STOCKER (Ber. deut.

bot. Ges., 1937, **55**, 370—376).—Relations between rates of transpiration and assimilation and the osmotic vals. of plants are examined. A. G. P.

Salt-resistance of the cotton plant. Localisation of salts in leaf tissues. V. S. SHARDAKOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, **16**, 431—432).—In cotton leaves accumulation of K and Cl occurs in the epidermis, glandular hairs, in cells lining the oil-secreting glands, and in leaf nectaries. In saline soils additional though small accumulations occur in the chlorophyll-bearing parenchyma and in the guard cells of stomata. A. G. P.

Influence of inorganic salts on the intake and elimination of dyes by plant cells. H. DRAWERT (Ber. deut. bot. Ges., 1937, **55**, 380—390).—The translocation of neutral-red from cell membranes into vacuoles in epidermal cells of the outer scales of bulbs of *Allium cepa* is dependent on the $[H^{\cdot}]$ of the sap, high sap acidity requiring high $[H^{\cdot}]$ in the external solution to effect the translocation. $CaCl_2$ and $AlCl_3$ restrict the intake of basic dyes probably by blocking the cell wall. This effect is influenced by the $[H^{\cdot}]$ of the salt solution. The salts have little effect on the intake of neutral dyes (rhodamine B). The permeability of the protoplasts is probably dependent on the p_H and lipin and tannin contents of the cell sap. A. G. P.

Cross transfer of mineral nutrients in the tobacco plant. J. E. MCMURTREY, jun. (J. Agric. Res., 1937, **55**, 475—482).—Effects on leaf and stem growth of differential feeding of portions of the root system are recorded. Deficiency of individual nutrients in solutions supplied to one half of the root system did not always induce unilateral symptoms in the aërial organs of the plant. The bearing of the results on fertiliser placement under field conditions is discussed. A. G. P.

Change in mineral composition of tomato plants irradiated with a quartz-mercury lamp; relation to the level and ratio of calcium and phosphorus in the nutritive medium. W. D. STEWART and J. M. ARTHUR (Contr. Boyce Thompson Inst., 1937, **9**, 105—120).—Tomato plants were grown outside, in the greenhouse, and under shading cloth on alternating solutions containing complete nutrients minus P or Ca and single salt solutions containing these elements. Plants grown on solutions lacking Ca or P showed no increase in these elements or in ash on irradiation. Level of supply and not the Ca : P ratio determined response to irradiation. Plants grown on low-P solutions were high in ash, and increasing the supply of this element lowered the ash content. Solutions having a high Ca : P ratio produced plants which responded to irradiation with an increase in ash and Ca whilst solutions with a low ratio produced plants responding with an increase in ash and P. With intermediate vals. of Ca and P ash, Ca, and P increased. Decreasing light intensity during summer increased dry wt., ash, and P content, but decreased Ca. H_3PO_4 at concn. of 1 p.p.m. was found to be a good source of P for tomato plants. J. M. A.

Intake and elimination of dyes by living [plant] cells. E. BÜNNING (Ber. deut. bot. Ges., 1937, **55**, 377—379).—Contemporary views are briefly discussed. A. G. P.

Influence of electric currents on the plasma permeability of plant cells. O. SUOLAHTI (Protoplasma, 1937, **27**, 496—501).—Cells of *Chara ceratophylla* which were subjected to electric currents while in solutions of sulphonic acid dyes do not absorb the dyes until the cells are irreversibly injured. No exosmosis of Cl′ took place from uninjured *Chara* cells, when subjected to electric currents in Cl′-free NO_3' solutions. Hence it is concluded that there is no reversible permeability increase effected by the electric current. V. B. W.

Influence of carbon dioxide on exosmosis of electrolytes from stem cells. H. KAHO (Protoplasma, 1937, **27**, 502—522).—Stem cells of seedlings of *Lupinus albus* were used. From experimental results it is concluded that the CO_2 diffusion in the plasma of the assimilating cells is a supplementary factor acting indirectly together with the direct action of light in producing an increase in the permeability of cells. V. B. W.

Manganese in the plant cell membrane. K. SCHÖNLEBER (Protoplasma, 1937, **27**, 599—618).—Marine plants can store Mn in the membrane of assimilating cells. The form of the Mn ppt. corresponds with that of either coherent crusts (*Enteromorpha*, *Caulerpa*) or independent plates in the outer walls of the cells (*Helodea*, *Zostera*, *Potamogeton*). V. B. W.

Sugar changes during the ripening of different fruits. G. LEONCINI and F. ROGAI (Ann. Sperim. agrar., 1935, **17**, 83—104; Chem. Zentr., 1936, i, 3931).—With advancing maturity of plums, peaches, and apricots reducing sugars give place to sucrose. Physiological relationships are discussed. A. G. P.

Changes in certain constituents of olives during the ripening period in relation to fat formation. G. LEONCINI and F. ROGAI (Ann. Sperim. agrar., 1935, **17**, 121—132; Chem. Zentr., 1936, i, 3931).—Changes in composition during ripening vary in extent in different varieties of olives. The N compounds show least and the fat content the greatest change. No relation between sugar and fat contents was apparent but the N-free extractives and fat were directly related. Reducing sugars predominate. A. G. P.

Biological oxidation of oxalic acid. I. W. FRANKE and K. HASSE (Z. physiol. Chem., 1937, **249**, 231—255; cf. Houget *et al.*, A., 1927, 905).—The moss *Hylocomium umbratum*, Ehrh., yields a water-sol. oxalic dehydrogenase which specifically attacks $H_2C_2O_4$, O_2 being taken up (no decomp. with acceptors other than O_2) and CO_2 and theoretical yields of H_2O_2 being produced. The dehydrogenase, which requires no co-enzyme, is separated and conc. by grinding the moss with water and dialysing or pptg. with alcohol–ether; it exhibits optimal activity at p_H 2·5 and is destroyed at 83° in water and at 98° in the moss. The optimal $[H_2C_2O_4]$ varies with the enzyme concn. The rate of decomp. of $H_2C_2O_4$ by the enzyme is only slightly affected by changing from air to pure

O_2 but is reduced to approx. one half in 5% O_2 in N_2 and to approx. one fifth by changing the temp. from 25·5° to 37·5°. The moss contains substances which inhibit the action of the dehydrogenase which is also inhibited by hydroxylamine, benzoquinone, quinol, diphenylamine, and KI but scarcely or not at all by hydrazine, phenylurea, phenylurethane, or chloral hydrate. W. McC.

Study of variety and virus disease infection in tubers of *Solanum tuberosum* by the ascorbic acid test. A. M. SMITH and W. Y. PATERSON (Biochem. J., 1937, **31**, 1992—1999).—The ascorbic acid contents of a large no. of healthy and diseased potato tubers from the 1935, 1936, and 1937 crops of 17 varieties are determined by the 2 : 6-dichlorophenol-indophenol method and by a modification suitable for rapid routine purposes. The vals. obtained vary considerably with the variety of tuber, with the freedom of the stock from virus disease, and with the duration of storage, but such factors as tuber size, season, and environment (*e.g.*, soil conditions and manuring) do not appear to influence the results. P. W. C.

Carbon dioxide storage. X. Effect of carbon dioxide on the ascorbic acid content, respiration, and p_H of asparagus tissue. N. C. THORNTON (Contr. Boyce Thompson Inst., 1937, **9**, 137—148).—The ascorbic acid content of asparagus tissue decreased by 8—52% on storage in an atm. containing CO_2 either added purposely or allowed to accumulate during respiration. Loss of ascorbic acid was most rapid during the early hours of exposure and occurred either during or following storage at all temp. from 2° to 27°. The greatest loss of ascorbic acid took place in the bud tissue. It also occurred in the stalk and there was no recovery when the tissue was exposed to air after the treatment. During exposure to CO_2 the rate of respiration and the [H·] of the tissue decreased (0·4—0·9 p_H unit). The acidity returned to the original vals. on removal of the tissue to air. N. C. T.

Factors influencing the development of ascorbic acid and glutathione in potato tubers following treatment with ethylene chlorohydrin. J. D. GUTHRIE (Contr. Boyce Thompson Inst., 1937, **9**, 17—39).—Potato tuber tissue probably contains other I-reducing substances than ascorbic acid and glutathione. Chlorohydrin does not increase the high ascorbic acid content of freshly harvested tubers, but prevents the normal decrease in ascorbic acid which normally follows cutting into pieces. With old tubers of low ascorbic acid content chlorohydrin increases the amount present, the max. being attained after 20 days at 10° and persisting over 1 month. Cutting these treated tubers increases their ascorbic acid content in 3 days. Butyl bromide increases the glutathione content of cut tubers. Production of ascorbic acid and glutathione in treated tubers occurs only in presence of air although O_2 is not the only factor concerned, and in cut and planted pieces is not due to sprouting which normally follows treatment. Diminution in the amount of ascorbic acid in stored tubers is not accompanied by a decrease in glutathione. A. G. P.

Relative potency of reductase in dry, wet, and germinated seeds of *Lupinus albus*. D. I. MACHT and H. F. BRYAN (Amer. J. Bot., 1937, **24**, 133—134).—Seeds soaked overnight had the highest reductase activity. Cotyledons of seedlings 1—6 days old showed progressive loss of activity. Vals. in stems and roots were much lower than in seeds or cotyledons. A. G. P.

Nitrogen metabolism [of plants] with ammonia and nitrate feeding in relation to iron. H. GAERTNER (Bodenk. Pflanzenernähr., 1937, **5**, 234—258).—Deficiency of Fe lowers the protein and increases the sol. N fraction of maize leaves, the effect being more marked in $NH_4^{\cdot}$- than in NO_3'-fed plants, although the total N increased in both cases. Among plants exhibiting the same degree of chlorosis there was no essential difference between the protein contents of $NH_4^{\cdot}$- and NO_3'-plants. A direct relation exists between chlorophyll and protein contents in chlorophyll-deficient plants. The effect of Fe deficiency in restricting photosynthesis is greater than its action in restricting protein synthesis. A. G. P.

Interaction of factors in the growth of *Lemna*. XI. Interaction of nitrogen and light intensity in relation to growth and assimilation. XII. Interaction of nitrogen and light intensity in relation to root length. H. L. WHITE (Ann. Bot., 1937, **1**, 623—647, 649—654; cf. A., 1937, III, 159).—XI. The optimum [NO_3'] in culture media for *Lemna* rises or falls with increase or decrease in light intensity. Conversely optimum intensity varies with the level of N supply. With the highest intensity examined a decrease in N supply is associated with lowered rate of increase in frond no., lower net assimilation, smaller frond area and protein content, and loss of chlorophyll. At the lowest intensity lowering the N supply produces the reverse changes in the plant. Characteristic symptoms of N deficiency are intensified by increase in light intensity with const. N supply, and those of NO_3' excess by decrease in intensity with const. NO_3' supply. Although photosynthesis is linearly related to intensity in the range 50—300 ft.-candles the rate of frond multiplication at 50 ft.-candles is not controlled by the low level of carbohydrate production. Correlation is established between dry wt. per unit area and starch content, between frond area and protein content, and between depth of frond colour and protein content. The N–light intensity relationship is discussed.

XII. With varying levels of N supply and light intensity root development is significantly correlated with the starch/protein ratio in the fronds. A. G. P.

Growth of liverworts from Katinai [Alaska] on "nitrogen-free" sand. R. F. GRIGGS (Amer. J. Bot., 1937, **24**, 295—298).—No evidence of N-fixation by liverworts was obtained. In "N-free" sand the plants subsisted for long periods on impurities present in amounts below those detectable by chemical tests of NO_3', NO_2', or NH_3. Such cultures became pale and unhealthy after 3 years but recovered on addition of NH_4NO_3. A. G. P.

Root nodule bacteria of leguminous plants. XX. Excretion of nitrogen in associated cultures

of legumes and non-legumes. A. I. VIRTANEN, S. VON HAUSEN, and T. LAINE. **XXI. Growth of root nodule organisms at low temperatures.** U. VARTIOVAARA (J. Agric. Sci., 1937, **27**, 584—610, 626—637).—XX. In sterile sand cultures wheat and barley utilised approx. 50% of the N excreted by pea root nodules. In mixed cultures an increase in the ratio non-legumes : peas diminished the growth of peas as a result of N starvation. In NO_3' cultures of uninoculated peas the ratio non-legumes : legumes did not affect the growth of peas. In one instance 83% of the N fixed by nodules was excreted into the substrate.

XXI. Differences in growth at 6—13° of strains of nodule organisms from different sources are examined. With low-temp. cultures of inoculated peas addition of mineral N (30 mg. per plant) had little effect on dry matter production and only very slightly lowered the protein and NH_2-acid content of the crop. A. G. P.

Chemical processes in *Sauromatum* flower spikes. A. W. H. VAN HERK (Proc. K. Akad. Wetensch, Amsterdam, 1937, **40**, 709—719).—Development of the inflorescence of *S. guttatum* is accompanied by increased respiration and a rise in temp. The enzyme system concerned is activated by a substance formed in the male flowers and translocated to the appendix shortly before emission of pollen. A. G. P.

Theory of assimilation. III. Dark reactions of assimilation ("Blackman reaction"). IV. Mechanism of assimilation unit. V. General survey. K. WOHL (Z. physikal. Chem., 1937, **B**, **37**, 169—185, 186—208, 209—230; cf. A., 1937, III, 500).—III. The suggested mechanism of the Blackman reaction is: (*a*) $X_4 \rightarrow X_5 + O_2$, (*b*) $X_5 + CO_2 \rightleftharpoons X_6$, (*c*) $X_6 \rightarrow X_0 + CH_2O$, where X_4 is the photo-inactive product formed by the absorption of four light quanta by the H_2CO_3–chlorophyll complex, X_0. Reaction (*a*) is enzymic and is bimol. and not very sensitive to temp., whilst in (*b*) equilibrium is established very rapidly, and (*c*) is unimol. and has a high temp. coeff. X_0 is also in equilibrium with the H_2CO_3 in the solution. The abnormally high temp. coeff. of the max. assimilation in continuous irradiation at low temp. may be due to variation with temp. of the ratio, Z, of the no. of chlorophyll mols. to reducing centres. An alternative explanation is that the reaction sequence (*a*), (*b*), (*c*) takes place five times and each time the CH_2O formed in (*c*) is displaced from the reducing centre and held by a neighbouring group in the chlorophyll mol. capable of binding OH, but when the sixth CH_2O mol. is formed it cannot be accommodated and together with the other five is released as a glucose mol. On this basis the high temp. coeff. of the Blackman reaction and its high speed at low temp. may be due to the simultaneous rupture of several linkings necessitated by the release of the glucose mol. permitting free rotation of the released groups (cf. A., 1937, I, 246).

IV. The mechanism of the "assimilation unit" in the theory that in assimilation all the light quanta absorbed by Z (≈ 2500) chlorophyll mols. are transferred to a single H_2CO_3 mol. held at a reducing centre is examined. One possibility is that most of the chlorophyll mols. have associated with them some mol. which on absorption of a quantum becomes excited, dissociates, and transfers the energy to the reducing centre; the rate of this process will be influenced by temp. only slightly. The retardation of the photo-reaction by surface-active substances is also explained by this theory. Another possible mechanism is that the assimilation unit consists of chlorophyll mols. packed together like a pile of coins so that the optically absorbing points are in immediate contact and in an approx. straight line; in such an assemblage light quanta could pass from one mol. to another without loss. The existing experimental data are inadequate to decide which is the correct mechanism.

V. A summary of I—IV. R. C.

Photosynthesis of *Chlorella* in heavy water. F. N. CRAIG and S. F. TRELEASE (Amer. J. Bot., 1937, **24**, 232—242).—With high light intensity and high [CO_2] photosynthesis in 99·9% D_2O was approx. 0·41 times that in water. In water–D_2O mixtures (containing HDO) the rate of photosynthesis was an additive function of the mol. proportions of the three components. D probably exchanges for H at a crit. point in a mol. concerned in the "dark reaction." Retardation of respiration by D_2O was less than that of photosynthesis. In the latter process the photochemical stage was not appreciably affected by D_2O. A. G. P.

Photosynthesis and the absorption spectra of plant pigments. I. G. R. BURNS (Amer. J. Bot., 1937, **24**, 257—265).—Experimental data obtained by the method described (A., 1937, III, 285) are utilised in a discussion of photosynthetic activity in different coloured light by seedlings of different colour. A. G. P.

Chloroplastin symplex and the formation of chlorophyll. W. A. BECK (Protoplasma, 1937, **27**, 530—533).—The favourable physico-chemical state for the formation of chlorophyll in higher plants is termed the "chloroplastin symplex." Effects of compressed CO_2, O_2, and air were studied. A stimulation, followed by fatigue, was observed with compressed air. V. B. W.

Development of plant pigments in seedlings grown in the dark. W. A. BECK (Studies Inst. Divi Thomae, 1937, **1**, 109—115).—Definite amounts of carotene and xanthophyll developed in the cotyledons of sunflower seedlings grown in the dark, xanthophyll developing more rapidly than carotene. S. J. C.

Physiology of *Coffea arabica*. II. Stomatal movements in relation to photosynthesis under natural conditions. F. J. NUTMAN (Ann. Bot., 1937, **1**, 681—693; cf. A., 1937, III, 443).—Evidence is advanced indicating that changes in assimilation rates are explicable on the basis of a direct influence of radiation on stomatal movement. A. G. P.

Photosynthesis of carbohydrates *in vitro*.—See A., I, 39.

Effect of β-indolylacetic acid on the development of plantules and plantule fragments of *Phaseolus vulgaris*. R. GAUTHERET (Compt. rend.

Soc. Biol., 1937, **126**, 312—314).—At high concns. the development of the gemmule and radicle is inhibited and production of nodes on the root and hypocotyl increased. Heteroauxin has a rhizogenic action and causes considerable branching of the roots. H. G. R.

Action of auxin on protoplasmic streaming. K. V. THIMANN and B. M. SWEENEY (Nature, 1937, **140**, 807—808).—Low concns. of 3-indolylacetic acid accelerate protoplasmic streaming in the epidermal cells of *Avena* coleoptiles. Acceleration is transient, but is prolonged by the addition of fructose. Coumarylacetic and *allo*cinnamic acids have an effect similar to indolylacetic acid. The effect of higher concns. of auxin depends on O_2 supply, and a retardation occurs when this is insufficient. This retardation is removed by more O_2, but is increased by dinitrophenol. Histidine delays it. The effects of auxin on streaming, and presumably also on growth, arise from the acceleration of a respiratory reaction. L. S. T.

Growth of wheat seedlings in solutions containing chemical growth substances. D. R. MARMER (Amer. J. Bot., 1937, **24**, 139—145).—Addition of indolyl-3-acetic, -propionic, and -butyric acids to buffered nutrient media at p_H 4·6 and 7·5 decreased the growth of the primary root, coleoptile, and first leaf, but increased the no. of secondary roots formed. The activity of the three acids was much lower and the relative difference in efficiency was much greater in alkaline media. The action of the growth substances is not due entirely to their effect on p_H. A. G. P.

Combined action of folliculin and the duration of illumination on the flowering of the China aster. P. CHOUARD (Compt. rend. Soc. Biol., 1937, **126**, 509—512).—Dihydrofolliculin accelerates the flowering of the China aster only when the illumination is intense and of short duration, whilst folliculin is without action. H. G. R.

Influence of parathyroid and thyroid hormones on growth of seedlings. E. D. BRAIN (Ann. Bot., 1937, **1**, 616—621)—Parathyroid extracts added to culture media diminished the root extension but did not affect growth of coleoptiles and leaves of *Avena sativa*. Similarly thyroid extracts decreased root growth in *Phaseolus multiflorus* and in some cases caused stunting of bean epicotls. A. G. P.

Resistance to poisons of desiccated plant tissue. W. W. ALLEN (Ann. Bot., 1937, **1**, 797—798; cf. A., 1931, 133).—Effects of alcohol, acetone, ether, and chloroform on a dried moss, *Hylocomium squarrosum*, a lichen, *Lecanora conizaeoides*, on *B. coli*, and on *Saccharomyces cerevisiæ* are recorded. A. G. P.

Determination of manganese in plants. N. D. COSTEANU (Bull. Soc. chim., 1937, [v], **4**, 1800—1803).—The procedure is based on the production of characteristic stains of different colour and intensity when drops of aq. $KMnO_4$ of known concn. are placed on filter-paper impregnated with solutions such as acidified H_2O_2, alkaline $K_3Fe(CN)_6$ or As_2O_3, $MnSO_4$, etc. The plant ash containing $Mn^{\cdot\cdot}$ is treated with $K_2S_2O_4$ in presence of $AgNO_3$ to effect oxidation to MnO_4', and the solution made up to a measured vol. and applied as above. E. S. H.

Phosphatic substances of vegetables. R. CULTRERA (Annali Chim. Appl., 1937, **27**, 426—434).—Methods for determining the total, sol., lipin-, nuclein-, phytin-, mineral, and undetermined P content of vegetables are examined in connexion with tomato seeds. The respective % P contents of two varieties of seeds were as follows: 0·859, 0·872; 0·793, 0·807; 0·0141, 0·0152; 0·042, 0·041; 0·639, 0·652; 0·092, 0·086; and 0·022, 0·028. L. A. O'N.

Phosphorus compounds of cottonseed. M. LISCHKEVITSCH (Maslob. Shir. Delo, 1937, No. 4, 20—22).—The kernels contain 1·84—2·28 and the husks 0·06—0·089% of P_2O_5. The kernels contain phytin 2·17—2·76, free phosphatides 0·1, combined phosphatides 1·6, and lecithin 1·0%, and the husks contain org. P 70, and inorg. P 30%. R. T.

Biochemistry of the olive with special reference to mannitol. R. NUCCORINI (Ann. Sperim. agrar., 1935, **17**, 21—40; Chem. Zentr., 1936, i, 3931—3932).—The isolation of mannitol, glucose, fructose, and oleanolic acid from olive leaves and mannitol from the fruit is described. Differences in the proportions of these constituents in different varieties of fruit are recorded. A. G. P.

Analysis of the carbohydrates of the cell wall of plants. V. Determination of methylpentoses singly and in simple mixtures. C. R. MARSHALL and F. W. NORRIS (Biochem. J., 1937, **31**, 1939—1944).—Using the improved distillation method (A., 1937, III, 367) the relations between furfuraldehyde, arabinose, xylose, pectolic anhydride, methylfurfuraldehyde, and rhamnose and the ppts. formed with phloroglucinol (the best precipitant), thiobarbituric acid, and barbituric acid (least satisfactory) have been determined. Suggestions are made regarding the analysis of mixtures of methylpentoses with pentoses and/or uronic acids. H. G. R.

Pectic acid from cotton fibre. S. A. HARRIS and H. J. THOMPSON (Contr. Boyce Thompson Inst., 1937, **9**, 1—5).—The isolation and identification of pectic acid from cotton fibre (yield 0·68% of crude product) is described. In the fibre pectic acid probably occurs as Ca pectate. A. G. P.

Isolation of pectic substances from wood. II. E. ANDERSON, L. W. SEIGLE, P. W. KRZNARICH, L. RICHARDS, and W. W. MARTENY (J. Biol. Chem., 1937, **121**, 165—174; cf. A., 1936, 534).—Pectic substances occur in mature hardwoods in greater amounts than in mature softwoods; in composition they both resemble that from plants. The pectic substances are present partly as insol. Ca salts and are formed early in growth. P. G. M.

Lignin. IX. Sub-fossilised elm wood. B. HOLMBERG (Kong. Norske Vidensk. Selsk. Forhandl., 1935, **7**, 133—135; Chem. Zentr., 1936, i, 4172; cf. A., 1936, 1515).—Examination of old and more recent fossilised elm indicates that of the original carbohydrate contents in the outer layers much was lost and the remainder humified. The lignin was but little changed. In the inner portions acidic matter had almost entirely disappeared and the pentosans

were largely destroyed. In a 4000-year-old sample, lignin retained its normal composition and reactivity. A. G. P.

Cork wax.—See A., II, 25.

Natural glucosides. I. Constitution of the glucoside present in *Murraya exotica*. P. K. BOSE and A. MOOKERJEE (J. Indian Chem. Soc., 1937, **14**, 489—491).—Petals of *M. exotica*, Linn., give 1·3% of scopolin, hydrolysed to scopoletin (esculetin Me ether) (methylated to the Me_2 ether). Murrayin and murrayetin (de Vry and Blas, Z. Chem., 1869, 310) are impure scopolin and scopoletin respectively. E. W. W.

Vegetable proteins. L. B. MENDEL and H. B. VICKERY (Carnegie Inst. Washington, Yearbook, 1935, **34**, 298—306; cf. A., 1936, 368).—Salt mixtures used in synthetic rations for rats are not interchangeable. When sub-optimal amounts are given the Ca content limits bone formation. High-protein, high-vitamin diets increase both the rate of growth and reproductive performance.

In plant analysis preformed NH_3 is best determined by vac. distillation, in presence of a PO_4''' buffer and 5% aq. borax, into NaOH followed by nesslerisation and use of a spectrophotometer. Total amide is determined by hydrolysis with N-H_2SO_4 (3 hr. at 100°) and subsequent distillation of NH_3. Glutamine in presence of asparagine is determined by hydrolysing in the presence of a buffer to produce a final p_H 6·5. Citric acid is oxidised by $KMnO_4$–KBr, and the pentabromoacetone is extracted with light petroleum and determined colorimetrically with Na_2S. Starch is extracted from powdered dry material by hot $CaCl_2$ or cold 21% HCl, pptd. with I–KI, and treated with dil. alkali in alcohol. The liberated starch is dissolved in hot water and the cooled solution is treated with acetic acid and KI–KIO_3 and the blue colour measured by the spectrophotometer. Tomatoes grown with NO_3' as N source produce 20 times as much citric, malic, and oxalic acid in the leaves and 8 times as much in the stems as when N is supplied as $NH_4^{\cdot}$. CH. ABS. (*p*)

New solvents of gluten proteins. M. I. KNIAGINICEV and T. M. GORELKINA (Compt. rend. Acad. Sci. U.R.S.S., 1937, **16**, 419—422).—Gluten is completely dissolved by 10% aq. Na salicylate or benzoate and on re-pptn. by cryst. $MgSO_4$ retains its initial solubility in NaCl, alcohol, and alkalis. Re-pptn. from alcoholic NaOH involves alteration in properties. Gluten from different genetic groups shows differences in solubility in the above solvents. A. G. P.

Microchemical determination and isolation of polymeride-bitumen. XIII. Membranes of spores and pollen. F. ZETZSCHE and E. ZIEGLER (Brennstoff-Chem., 1937, **18**, 395; cf. A., 1937, III, 408).—10—60 mg. of the sporopollenin are weighed into a specially designed micro-filter and, after treatment first with Br and then with fuming HNO_3, washed, dried, and reweighed (cf. A., 1932, 665). A. B. M.

Alkaloids of the seeds of *S. microphylla*, Ait.—See A., II, 35.

Minor alkaloids of *Duboisia myoporoides*.—See A., II, 34.

Ergocrystine and ergocristinine, alkaloids of ergot.—See A., II, 35.

Alkaloids of *Veratrum album*. Protoveratridine, germerine, and protoveratrine.—See A., II, 35.

Spectrographic examination of the cinchona alkaloids. C. G. VAN ARKEL and P. VAN DER WIELEN (Pharm. Weekblad, 1937, **74**, 1514—1518).—The total alkaloids from the root-bark, trunk-bark, branch-bark, and leaves of *C. Ledgeriana* trees and seedlings and from *C. succirubra* seedling have been examined spectrographically. The alkaloids from the leaves show the greatest similarity amongst the various plants. The absorption curve for the alkaloids from the barks of *succirubra* resemble that of *Chinetum*, whilst the curve for the alkaloids from *Ledgeriana* bark is like that of quinine. It is possible by this means to detect a grafting of one species on a plant of a different species. S. C.

Determination of the alkaloids of lupins. Z. WIERZCHOWSKI (Biochem. Z., 1937, **293**, 192—206).—Finely ground lupin seeds are treated with 10% aq. NaOH and extracted with 1 : 1 ether–chloroform, which is then extracted with dil. HCl. The sparteine and lupinine are pptd. from the acid solution with silicotungstic acid, the ppt. is decomposed with 5% aq. NaOH and the alkaloids thus purified are extracted with chloroform, which is then extracted successively with dil. HCl and water. Sparteine is determined by pptn. in neutral solution with picrolonic acid and lupinine is determined in the filtrate by pptn. in 0·02N-HCl with silicotungstic acid. Bitter yellow lupins contain 0·20—0·37% of sparteine and 0·43—0·73% of lupinine. The corresponding val. for sweet yellow lupins are 0·014—0·032% and 0·044—0·106% respectively. W. McC.

Carotenoids of fresh-water algæ. III. *Hæmatococcus pluvialis*. I. J. FISCHER (Z. physiol. Chem., 1937, **250**, 147—154; cf. A., 1936, 1571).—The dried algæ (6 g.) yield 45 mg. of euglenarhodone together with small amounts of β-carotene, lutein, zeaxanthine, and *hæmatoxanthine*, m.p. 205°, and traces of α-carotene and fat. Hæmatoxanthrine exhibits max. light absorption at 478, 480, and 513 mμ. in light petroleum, ether, and carbon disulphide, respectively. The carotenoids occur as esters. W. McC.

Carotene in sapropel.—See A., I, 52.

Neotocopherol, a constituent of wheat-germ oil and other constituents of the oil.—See A., II, 13.

Recording potentiometer for use in physiological investigations. R. H. WALLACE (Plant Physiol., 1937, **12**, 487—498).—The instrument is described and its use in electrometric titration, measurement of light intensity, etc. is indicated. A. G. P.

Simple direct-coupled amplifier for action potentials. A. FORBES and A. M. GRASS (J. Physiol., 1937, **91**, 31—35). A. C.

Arrangement providing gradually increasing and decreasing galvanic currents. K. SCHILLER (Z. Biol., 1937, **98**, 337—346).—An electric circuit is described (intended mainly for the purpose of electro-

narcosis) enabling rates of rise and fall of a galvanic current to be adjusted. B. K.

Dissociation of thresholds in electrodiagnoses. H. FISCHGOLD (Compt. rend. Soc. Biol., 1937, **126**, 503—504).—Galvanic stimulation in conjunction with condenser discharge is used instead of the induction coil in testing for reaction of degeneration. D. T. B.

Magnetic electron microscope and its use in biology. F. KRAUSE (Naturwiss., 1937, **25**, 817—825).—A review.

Disturbance-free triple cardiography. H. E. HOLLMANN (Z. Instrumkde., 1937, **57**, 117—124).—Description of a circuit for triple cardiography with high amplication so that all disturbances due to stray fields are eliminated. O. D. S.

Recording methods for electrocardiography. H. E. HOLLMANN and W. HOLLMANN (Z. Instrumkde., 1937, **57**, 147—167).—The application of the cathode-ray oscillograph to electrocardiography is discussed. The method of Schellong (Kongr. inn. Med., München, 1936, 288) is extended and applied to triple cardiography. O. D. S.

Operating table with thermoregulator. H. J. FUCHS and C. REID (J. Physiol., 1937, **91**, 10—11P).—The heating elements of the table are controlled by a thermoregulator inserted into the animal's rectum. A. C.

Polarography in medicine. C. TROPP (Klin. Woch., 1937, **16**, 374—377).—A detailed account is given of the use of the polarograph of Heyrovský for the examination of coupled reactions. F. W. L.

Spectroscopic method for kinetic study of chemical reactions.—See A., I, 47.

Ultra-centrifuging of bacteriophages. A. GRATIA (Compt. rend. Soc. Biol., 1937, **126**, 421—422; cf. A., 1937, III, 333, 447).—Modifications in the design and material of the cups of the Henriot and Huguenard ultra-centrifuge are described. H. G. R.

Determination of the "neutrality" of ampoule glass. M. CINI (Boll. Chim. farm., 1937, **76**, 555—557).—A reply to criticisms of previously published work (B., 1936, 234, 594). F. O. H.

Modification of Haldane gas analysis apparatus. H. J. FUCHS (J. Physiol., 1937, **91**, 8—10P). A. C.

Determination of residual moisture in dry biological material. E. W. FLOSDORF and G. W. WEBSTER (J. Biol. Chem., 1937, **121**, 353—359).—Complete removal of water without decomp. is attained at $\not>50°/0·1$—$0·2$ mm. for $\not>48$ hr. W. McC.

Volumetric determination of chloride in 0·3 μl. of tissue fluid. V. B. WIGGLESWORTH (Biochem. J., 1937, **31**, 1719—1722).—The application of capillary pipettes coated with paraffin to the Volhard titration (with or without removal of AgCl) is described. P. G. M.

Determination of carbon disulphide in blood. J. R. HARROWER and F. H. WILEY (J. Ind. Hyg., 1937, **19**, 486—490).—CS_2 is removed from the hæmolysed blood by passing through it a stream of purified air, which is then drawn through aq. $CdCl_2$, to remove H_2S, and through alcoholic KOH, which converts the CS_2 into K ethylxanthate; the latter is determined by titration with I. Fair accuracy is obtained with 10 c.c. of blood containing 0·05 mg. of CS_2 per 100 c.c. E. M. K.

Determination of cholesterol. E. C. H. J. NOYONS (Acta brev. neerl. Physiol., 1937, **7**, 15—18).—Cholesterol is pptd. by digitonin, which is subsequently hydrolysed and the liberated hexose determined iodometrically. T. F. D.

Micro-determination of iodine values of tissue-sterols, especially ergosterol. M. YASUDA (J. Biochem. Japan, 1937, **25**, 417—433).—The I (or Br) val. of ergosterol given by reagents using, *e.g.*, chloroform or acetic acid as solvent is generally too high. A solution of 2 mg. of ergosterol in 4 c.c. of methyl alcohol + 1 c.c. of acetic acid halogenised by Rosenmund–Kuhnhenn reagent (cf. A., 1932, 185) gives fairly accurate vals. Digitonin absorbs only small amounts of Br [10 mg. of digitonin is equiv. to 0·08 c.c. of 0·02N-$Na_2S_2O_3$] and hence the determination can be applied directly to the sterol digitonide. Application of the method to tissue-sterols is exemplified. F. O. H.

Volumetric determination of potassium in biological materials. H. E. HARRISON and D. C. DARROW (J. Biol. Chem., 1937, **121**, 631—635).—The material is ashed and, if necessary, PO_4''' removed. To the residue, dissolved in water or dil. HCl, is added sufficient H_2PtCl_6 in (N-HCl) to combine with all the Na and K, and the solution is evaporated until salts separate but remain moist on cooling. 80% alcohol is added, the solution filtered, and the ppt. washed free from Cl′. The pptd. K_2PtCl_6 is dissolved in small amounts of hot water, and to an aliquot part (containing 0·156—1·56 mg. of K) there is added 0·4—0·5 c.c. of 15% $NaHSO_3$, and the solution is boiled for 1 min. 3 c.c. of 0·05N-$AgNO_3$ and 2—3 drops of H_2O_2 are then added, and the solution is boiled, cooled in ice, and titrated by the Volhard method. The accuracy is ±1%. J. W. S.

Clinical determination of salicylates in body fluids. L. E. ONTANEDA and A. V. J. FERLONI (Rev. Soc. Argentina Biol., 1935, **11**, 474—481).—Marenzi's modification of the Theis–Benedict method is utilised. 1 mg. of Na salicylate per 100 c.c. of blood or urine may be determined. CH. ABS. (*p*)

Determination of the amino-group in amino-acids. Preservation of the capacity of reacting with nitrous acid after treatment with formaldehyde. W. L. DULIÈRE (Compt. rend. Soc. Biol., 1937, **126**, 441—442). H. G. R.

Effect of certain solvents and of sequence of extraction on removal of fat and ash constituents from bones of chicks. R. B. DUSTMAN (J. Assoc. Off. Agric. Chem., 1937, **20**, 469—475).—Acetone and ether remove approx. equal amounts of extractive, acetone removing less ash. Abs. and 95% alcohol remove much more total extract and ash than acetone and ether. When alcohol precedes acetone and ether, total extract is less than when the order is reversed. Ether or acetone used after 95% alcohol removes little, but in the converse order 95% alcohol removes much, additional extract. E. C. S.