

BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

A., III.—Physiology and Biochemistry

JUNE, 1938.

(a) HISTOLOGY.

Modification of the Masson trichrome technique for routine laboratory purposes. J. GOLDNER (Amer. J. Path., 1938, 14, 237—243).

C. J. C. B.

Acidophil cellular "inclusions" in nerve tissue and kidney of "normal" pigeons. S. NICOLAU and L. KORCOWSKA (Ann. Inst. Pasteur, 1938, 60, 308—315).—Three types of eosinophil cellular "inclusion" bodies were found in the brain and spinal ganglia of apparently normal pigeons; in the latter case, nodular and perivascular mononuclear cell infiltration was also present. A fourth type of "inclusion" was found in the kidneys of 3 out of 9 pigeons (but not chickens or mammals) dead from Aujeszky's disease. These "inclusions" may represent true infections with unknown viruses, which do not give rise to symptoms. Their importance as a source of error in the histo-pathological study of virus diseases is pointed out. G. P. G.

Further observations on intranuclear inclusions produced by non-virus materials. P. K. OLITZKY and C. G. HARFORD (Proc. Soc. Exp. Biol. Med., 1938, 38, 92—94).—Suspensions of brain tissue or of $Al(OH)_3$ injected subcutaneously into guinea-pigs cause intranuclear inclusions in the tissue nodules produced. In the mouse and rabbit they do not occur. A no. of other tissues and extracts were also tried on the guinea-pig with negative results. V. J. W.

Deposition of calcium salts in giant cells. K. ZÄH (Beitr. path. Anat. allg. Path., 1937—1938, 100, 126—136).—Ca salts may be found in giant cells following degeneration of the cells or may be due to a secondary formation of foreign body giant cells around concretions of Ca salts. H. W. K.

Structure of the Golgi apparatus. III. Mechanism of secretion of Golgi bodies in the intestinal cells of *Lumbriconereis*. M. K. SUBRAMANIAM (Proc. Indian Acad. Sci., 1938, 7, B, 125—131; cf. *ibid.*, 80).—The alimentary canal of *Lumbriconereis* contains vacuolated cells containing watery mucous secretion, and cells containing large granules. The behaviour of the Golgi apparatus during secretion is described and a theory of its mechanism is given. E. M. W.

Improved Warthin-Starry method of staining spirochaetes in tissue section. D. A. KERR (Amer. J. clin. Path., Tech. Suppl., 1938, 2, 63—67).

C. J. C. B.

(b) BLOOD AND LYMPH.

Culture of human marrow: apparatus for large-scale culture. E. E. OSGOOD (Amer. J.

med. Sci., 1938, 195, 141—144).—A simple and inexpensive apparatus (capacity 200 c.c. or over) for the culture of human marrow is described. Temp., p_H , O_2 and CO_2 tension, composition of the medium, and the removal of waste products without loss of cells may be controlled. A continuous flow of both gas and medium permits conditions in the culture flask to be kept const. It is possible to remove mixed samples of culture at frequent intervals in quantities sufficient for any type of hæmatological, chemical, bacteriological, or serological examination. R. L. N.

Sternal puncture. N. GINGOLD (Sang, 1938, 12, 390—397).

C. J. C. B.

New trephine for sternal biopsy. A. GRIMBERG (Sang, 1938, 12, 316).

C. J. C. B.

Sugar content of sternal marrow. S. GREIF (Klin. Woch., 1937, 16, 1191—1192).—The content in 21 healthy fasting subjects varied between 39 and 155 mg.-%. In 12 cases it differed by more than 10% from the blood-sugar. In hyperglycæmia the increase in the marrow was not parallel and simultaneous. F. W. L.

Bone-marrow picture in scarlet fever. J. CHALIER and L. REVOL (Sang, 1938, 12, 241—252).—The bone marrow was examined by repeated sternal puncture in 14 cases of scarlet fever. In the first 15 days there was an increase of immature and later of mature neutrophils, the change lasting longer than the concomitant blood reaction; the bone-marrow eosinophilia also appeared earlier and was more marked than the blood eosinophilia. A slight erythropoietic hypoplasia led to a slight anæmia about the end of this period. After the 15th day the neutrophilia returned to normal; the eosinophilia diminished and then increased again to a max. between the 20th and 25th day, and then fell to normal, and there was a definite increase of erythropoietic activity. C. J. C. B.

Action of astringents in human leucocyte cultures. G. WALLBACH (Sang, 1938, 12, 253—274).—A method is described for using cultures of human leucocytes for the evaluation and standardisation of astringent substances such as tannalbin, targesine, collargol, and solganol. Irritant substances (oil of turpentine, apiol, croton oil) of known action on the culture are added to it and then the effect of the addition of the astringent under test on the inflammatory process is watched. C. J. C. B.

Rapid cure of agranulocytosis caused by bismuth by treatment with vitamins-A, -B, and -C. C. MASSIAS and P. H. QUAT (Sang, 1938, 12, 363—368).—A case is described. C. J. C. B.

Granulocytopoietic fraction of yellow bone marrow. C. M. MARBERG, and H. O. WILES (Arch. Int. Med., 1938, 61, 408—429).—4 patients with leucopenia and 6 with malignant neutropenia were given yellow bone-marrow concentrate by mouth; all recovered. The concentrate is considered to contain substances which stimulate the maturation or liberation of granulocytes. T. H. H.

Treatment of agranulocytosis with leukæmic blood. M. NETOUSEK (Sang, 1938, 12, 345—348).—Historical review. C. J. C. B.

Experimental granulopenia, with particular reference to thiol (glutathione) metabolism in blood dyscrasias. F. P. PARKER and R. R. KRACKE (Amer. J. clin. Path., 1936, 6, 41—56).—Glutathione is a factor in the regulation of bone-marrow activity, its depletion in blood and marrow leading to aplasia and leucopenia. Rabbits in which leucopenia was induced by injections of benzene showed diminished contents of glutathione in marrow and blood. Blood-glutathione was lowered in aplastic anæmia and agranulocytosis and increased in pathological leucocytic stimulation.

CH. ABS. (p)

Peroxidase reaction of monocytes. T. SUZUKI (Tôhoku J. exp. Med., 1938, 32, 510—528).—Monocytes give a positive peroxidase reaction. The differential monocyte count in blood films is directly related to the intensity of the peroxidase reaction. A. S.

Nuclear shift of neutrophils in infantile atrophy. T. SUZUKI and S. SHIRAISHI (Tôhoku J. exp. Med., 1938, 32, 464—469).—Blood from cases of infantile atrophy shows a shift to the right of the neutrophil cells. A. S.

Studies of Gaucher cells by the supravital technique. L. A. ERF (Amer. J. med. Sci., 1938, 195, 144—150).—In 5 cases of Gaucher's disease 3 had unusual associated findings. The first showed myelocytes and myeloblasts in the peripheral blood; the second had no palpable enlargement of the liver or spleen, and the third was severely jaundiced. Many of the Gaucher cells contained vacuoles or "foam," probably intracellular bodies. The supravital staining characteristics of Gaucher cells are described. R. L. N.

Aleukæmic lymphadenosis with pernicious anæmia. W. CHRISTEN and S. GREIF (Wien. Arch. inn. Med., 1938, 32, 85—96).—A case is reported with aleukæmic lymphadenosis (large spleen, 2000—4500 white cells with 66% lymphocytes in blood and 92% in bone-marrow smears; many immature and pathological lymphocytes) and hyperchromic anæmia (increased colour index of 1.22; megalocytes; megaloblasts). A. S.

Morphological studies of blood platelets. A. DREYFUSS, S. JACOB, and J. JUGAND (Sang, 1938, 12, 460—463).—In the normal blood film 3 types of platelets may be distinguished: (1) platelets with prolongations, (2) platelets without prolongations, or (3) with a single prolongation with a thickened end. Normally (1) are 70—80% while (2) and (3), which may be considered together, constitute 20—30%.

There is a marked increase in the % of (2) and (3) platelets in thrombocytopenic purpura.

C. J. C. B.

Case of thrombopathia. H. FLEISCHHACKER and P. GRÜNEIS (Wien. Arch. inn. Med., 1938, 32, 47—54).—A case of sporadic thrombopathia (Willebrand-Jürgens type) is reported; the thrombocyte count is normal, but the cells are abnormally large and show little agglutination. These thrombocytes are derived, as shown by bone-marrow smears obtained by sternal puncture, from megalokaryocytes with excessive azur-granulation and little nuclear segmentation. A. S.

Treatment of thrombocytopenic purpura with stryphnon. H. FLEISCHHACKER (Wien. Klin. Wschr., 1938, 51, 449—451).—Intramuscular injections of stryphnon (an adrenaline derivative) in this condition increases the thrombocyte count and leads to a disappearance of the purpuric state. A. S.

Platelet-reducing substance in the spleen of thrombocytopenic purpura. C. E. TROLAND and F. C. LEE (Johns Hopkins Hosp. Bull., 1938, 62, 85—86).—An aq. acetone extract of the thrombocytopenic spleen was evaporated and injected into rabbits. The no. of platelets fell to 10% of the initial no. after 24 hr., and the blood clotting time was simultaneously greatly prolonged. T. F. D.

Thrombocytopenic purpura following acetyllallysopropylcarbamide (Sedormid). (A) A. M. HOFFMAN, J. KAHN, and J. P. FITZGIBBON. (B) A. M. MOODY (J. Amer. Med. Assoc., 1938, 110, 725—726, 726—727).—(A) 3 cases are reported in which the development of thrombocytopenic purpura followed the taking of Sedormid. Since all the patients had previously taken the drug without untoward effect, the development of an allergic sensitivity is suggested.

(B) A case report of thrombocytopenic purpura which developed following the use of Sedormid.

R. L. N.

Blood platelets in hookworm anæmia. J. W. LANDSBERG (Amer. J. Hyg., 1938, 27, 316—320).—In young dogs given fatal and non-fatal infections of the dog hookworm, *Ankylostoma caninum*, there was no change in the no. of thrombocytes in the peripheral circulation. G. P. G.

Changes in the composition of blood during mental and light physical work. R. M. SKLIANSKAIA, C. E. SHAKHNOVICH, A. E. LEVINA, and A. I. ZAK (J. Ind. Hyg., 1938, 20, 169—178).—A neutrophil leucocytosis with a shift to the left was observed in all subjects on most occasions, during mental work. Changes in hæmoglobin and colour index, in no. of lymphocytes and platelets, and in viscosity were irregular. Similar changes were observed during 4 kinds of light work. The degree of blood change did not depend on the intensity of the work, but appeared to be related to the emotional state of the subject.

E. M. K.

Permeability of erythrocytes to cations. J. F. DANIELLI and H. DAVSON (J. Physiol., 1938, 92, 25p).—Centrifuging cells from Ringer solution causes significant losses of K probably due to a mechanical

stretching of the cell membrane (ox, dogfish, rabbit, man, horse). F', CN', CO, urethane, and phenylurethane cause no appreciable loss of K at 20°. Permeability of the membrane to hæmoglobin produced by hæmolytic agents is preceded by a stage of permeability to cations in the case of heavy metals, e.g., Ag, but not with saponin. J. A. C.

Isotonic solutions of sulphates of bivalent cations. W. NIXON and R. C. A. CULBERT (Pharm. J., 1938, 140, 411).—Concns. of $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$, $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, and $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ approx. isotonic with blood serum are 5.60, 6.59, 5.89, and 5.89% wt./vol., respectively. These concns. produce no hæmolysis. F. L. U.

Osmotic properties of the erythrocyte. X. Permeability of the erythrocyte to ammonia and the ammonium ion. M. H. JACOBS and A. K. PARPART (J. Cell. Comp. Physiol., 1938, 11, 175—192).—NaOH or aq. NH_3 added to a suspension of red cells in saline to bring the p_H to 9.1 causes in the case of NH_3 a swelling of the cells followed by a shrinkage, and in the case of NaOH a shrinkage only. When NaOH is added to hæmolyzing hypotonic suspensions, it decreases hæmolysis whenever it is added; when NH_3 is so added it decreases hæmolysis when added early, and increases it when added late. V. J. W.

Red cell envelope considered as a Wiener mixed body. F. O. SCHMITT, R. S. BEAR, and E. PONDER (J. Cell. Comp. Physiol., 1938, 11, 309—313).—Previously described optical properties of the rabbit's red cell agree with known results of analysis indicating that the lipins of the cell are conc. in the cell envelope. V. J. W.

Electrical charge of mammalian red blood cells under normal conditions and in the anæmias. L. S. MOYER and H. A. ABRAMSON (Physical Rev., 1936, [ii], 50, 398).—The lowest net charge density (calc.) is 1890 e.s.u. in the rabbit, and the highest, 5600 e.s.u. in the dog. The order of increasing charge density is rabbit, sloth, pig, opossum, guinea-pig, man, and rhesus monkey (approx. 4500 e.s.u. per sq. cm.), cat, mouse, rat, and dog. This order is completely changed if the effective no. of electrons at the surface of the cell is calc. In human anæmia, abnormal cells appear to possess a mechanism which keeps the surface density of net charge const. when large changes in surface area occur. L. S. T.

Permeability of erythrocytes. IV. Permeability of "ghosts" to cations. H. DAVSON and E. PONDER (Biochem. J., 1938, 32, 756—762; cf. A., 1937, III, 449).—The erythrocyte "ghost" is readily permeable to cations. This is discussed in relation to electrical properties of "ghosts" and the mechanism of hæmolysis. E. M. W.

Effect of administration of ascorbic acid and citrin on the content of erythrocytes capable of being stained in guinea-pigs' blood. II. H. VON EULER and M. MALMBERG (Z. physiol. Chem., 1938, 252, 24—30; cf. A., 1937, III, 498).—The great increase produced by administration of ascorbic acid or citrin in the reticulocyte count of the blood of

scorbutic guinea-pigs occurs only after the erythrocyte content has diminished greatly as a result of deficiency of ascorbic acid. Scurvy is possibly a consequence of the lack of intermediate catalysts concerned in the degradation of carbohydrates.

W. McC.

Determination of size and hæmoglobin content of the average red blood cell. W. P. BELK (Amer. J. clin. Path. Tech. Suppl., 1938, 2, 60—63).

C. J. C. B.

Hæmoglobin in the red blood corpuscle. G. A. ADAMS (Biochem. J., 1938, 32, 646—650; cf. A., 1934, 673).—Blood corpuscle suspensions do not exhibit an ultra-violet absorption band at 410—400 m μ . Corpuscle "stromatin" and hæmoglobin can be combined *in vitro*, giving a compound with an ultra-violet spectrum similar to that of hæmoglobin in corpuscles; such a compound probably exists in the corpuscle. It is labile and appears to be a union between stromatin and the globin fraction of hæmoglobin. J. N. A.

Size of erythrocytes. E. FREERKSEN (Klin. Woch., 1937, 16, 1238—1241).—Statistical treatment of the variations in the newborn and adult.

F. W. L.

Hæmolytic anæmia. I. Hæmolysis, compensatory regeneration, and erythroblastosis. II. Anti-hæmolytic factor in human plasma. H. W. JOSEPHS. III. Anti-hæmolytic factor in pig's plasma. H. W. JOSEPHS and P. WINOCUR (Johns Hopkins Hosp. Bull., 1938, 62, 25—52, 53—69, 70—76).—I. Using blood reticulocytes and faecal urobilin as measures of blood formation and destruction respectively, in the absence of any considerable degree of erythroblastosis, it was found that in cases of human hæmolytic anæmia the relationship could be accurately expressed as an equilibrium. Urobilin excretion can thus be used as an index of blood destruction in the hæmolytic anæmias, except those of the "pernicious" type; the course of the disease, especially crises, can be followed by balancing blood destruction against formation. A crisis may develop after an increase in hæmolysis if there is a lag in the compensatory increase in erythropoietic activity.

II. In the ether-insol. fraction of conc. protein-free normal human plasma there is a substance effective by intramuscular injection in minute amounts which reduces the rate of blood destruction in sickle cell anæmia and congenital hæmolytic jaundice.

III. Pig plasma was deproteinised by 95% alcohol and the filtrate evaporated in vac. Lipins were then extracted with acetone and the residue was taken up in alcohol, filtered, and the filtrate evaporated. This alcohol-sol. fraction was dissolved in water and used for intramuscular injection in human sickle cell anæmia with good results. T. F. D.

Hæmolytic power of soaps of the alkali metals. Effect of the nature of the fatty acid. R. CAVIER (Bull. Soc. Chim. biol., 1937, 19, 1663—1675).—Max. hæmolytic power of soaps occurs at p_H 5.8—6.2. Myristic acid has the max. activity in the C_{12} — C_{18} series of saturated acids. Intensity of hæmolytic power is proportional to the no. of double

linkings in unsaturated acids, but is unaffected by the presence of OH groups. P. G. M.

Hæmolysis caused by snake venoms. Preliminary report. R. N. CHOPRA and A. C. ROY (Indian Med. Gaz., 1936, 71, 21—23).—Passage through Seitz filters renders the venoms (cobra, Russell's viper) non-hæmolytic. CH. ABS. (p)

Refractory anæmia. C. P. RHOADS and W. H. BARKER (J. Amer. Med. Assoc., 1938, 110, 794—796).—Analysis of 100 cases of anæmia refractory to treatment showed the existence of 2 major groups, those of primary and those of secondary anæmia. The condition cannot always be differentiated on hæmatological evidence. Subdivision of the cases of primary anæmia on a pathologic basis is described.

R. L. N.

Cause of anæmia in pulmonary tuberculosis. E. PILGERSTORFER and H. SEYFRIED (Wien. Arch. inn. Med., 1938, 32, 63—70).—Bone-marrow smears, obtained by sternal puncture, showed that the anæmia in 92 cases of pulmonary tuberculosis was due to a toxic inhibition of bone-marrow activity. Increased hæmolysis occurred only exceptionally.

A. S.

Chronic hypochromic anæmia in women. S. G. MEYERS, A. H. PRICE, H. C. MACK, L. J. FOSTER, and E. A. SHARP (Ann. intern. Med., 1938, 11, 1590—1599).—26 women with hypochromic anæmia were observed and treated over a period of 27 months.

C. A. K.

Chronic nutritional hypochromic anæmia. L. S. P. DAVIDSON and H. W. FULLERTON (Edinb. med. J., 1938, 45, 1—23, 102—131).—Examination of about 3000 individuals of the poorest classes shows that anæmia frequently occurs, particularly in infants and in adult women, owing to dietary deficiency in Fe and vitamins. The relative importance of Fe and vitamins in the production of nutritional changes in the tongue, nails, and central nervous system is discussed. The view that achlorhydria associated with chronic nutritional hypochromic anæmia is familial in origin and precedes the anæmia is not accepted. The gastric defect, anæmia, and nutritional changes are primarily all due to long-continued dietary deficiency. An intensification of the deficiency state is secondarily produced as a result of the failure in digestion and decrease in absorption which follow the onset of gastritis.

J. M. R.

Nutritional anæmia in cattle in [south-eastern Massachusetts]. J. G. ARCHIBALD, K. J. KUČINSKI, R. O. BROOKE, and S. L. FREEMAN (J. Dairy Sci., 1938, 21, 59—68).—The local cattle disease, "neck ail," characterised by emaciation, loss of appetite, and decreases in red blood cell count and hæmoglobin content, is identical with nutritional anæmia and is due to the low Fe content of forage and soils. Immediate recovery followed the feeding of Fe compounds or dressing soils with Fe NH₄ citrate.

W. L. D.

Enzymic theory of hæmopoiesis. C. RIMINGTON (Compt. rend. Trav. Lab. Carlsberg, 1938, 22, 454—464).—Theoretical.

J. N. A.

Observations on seventy-eight cases of pernicious anæmia with special reference to weight changes. E. JONES (Amer. J. Med. Sci., 1938, 195, 150—154).—In an analysis of wt. changes in 44 patients with pernicious anæmia, wt. gains were recorded in 28 cases following sp. therapy. A factor in liver extract, other than the hæmopoietic, may affect the body-wt. R. L. N.

Iron retention in pernicious anæmia, lead poisoning, and myxœdema. W. M. FOWLER and A. P. BARER (Arch. Int. Med., 1938, 61, 401—407).—Fe balance studies were made of patients with pernicious anæmia, chronic Pb poisoning, and myxœdema. Fe NH₄ citrate administered with a liver fraction, produced a retention of 25—34% of the administered Fe. This is comparable with the amount of Fe retained in hypochromic anæmia under similar circumstances.

T. H. H.

Anaphylactic reactions following medication with parenteral liver extract. C. L. KRANTZ (J. Amer. Med. Assoc., 1938, 100, 802—803).—A case of pernicious anæmia failed to show complete symptomatic improvement after oral therapy, but a return to normal followed parenteral treatment. Reactions of an allergic nature occurred after injections of liver extract.

R. L. N.

Report on potency of liver products. UNITED STATES PHARMACOPEIA ANTI-ANÆMIA PREPARATIONS ADVISORY BOARD (J. Amer. Med. Assoc., 1938, 110, 812).

R. L. N.

Components of liver preparations highly active towards pernicious anæmia. II. P. KARRER, P. FREI, and B. H. RINGIER (Helv. Chim. Acta, 1938, 21, 314—315; cf. A., 1937, III, 418).—Further purification of the preps. shows that P, pentose, and the bulk of the purines can be removed without diminution of physiological activity. The products do not contain a flavin, pterin, or reducing carbohydrate. The biuret reaction is negative or feebly positive. The best preps. give the ninhydrin reaction before and after hydrolysis. Analyses gives C 45.68, H 6.75, and N 14.63%; S is present. They are not polypeptides of the usual type. At most only very small amounts of α -amino-acids are present.

H. W.

Acute hæmolytic anæmia (Lederer type). E. H. BAXTER and M. W. EVERHART (J. Pediat., 1938, 12, 357—362).—A typical case is described which recovered after transfusions.

C. J. C. B.

Fate of erythrocytes and granulocytes in the spleen following their injection into the blood stream. H. WEHRLE (Arch. Path., 1938, 25, 514—526).—By perfusing the spleen, the red cells and lymphocytes were washed away from both the splenic cords and the sinuses but the mononuclear phagocytes and granulocytes persist. In the normal rabbit spleen there was active phagocytosis and intracellular digestion of both red cells and granulocytes by the phagocytes of the splenic cords and sinuses. This was increased after transfusion of blood cells into a rabbit, reaching a max. between 16 and 18 hr. The red cells within the phagocytes fuse, stain deeply with eosin, but rapidly form a pale

yellow Fe-free pigment. Intracellular digestion of granulocytes was characterised by clumping and dissolution of granules, by fragmentation, pyknosis and dissolution of nuclear substance, and formation from the nuclear material of globules that stain with acid dyes. C. J. C. B.

Spleen and surface of red corpuscles. J. G. STEPHENS (J. Physiol., 1938, 92, 39—41p).—Examination is made of the surface qualities of red corpuscles as expressed by their electrokinetic potentials measured with Brown and Broom electrophoresis cells in isotonic sucrose solution buffered at p_H 7.4. A primary function of the spleen is the repair of the red cell as regards its surface and electrolyte content; the repaired corpuscle is less vulnerable to osmotic damage and leakage during repeated ionic interchange of the respiratory cycle. J. A. C.

Recent work on the function of the spleen. E. SCHLIEPHAKE (Dtsch. med. Wschr., 1938, 64, 560—562).—A review. A. S.

Formation of coproporphyrin I and hæmoglobin during embryonic life. F. SCHÖNHEYDER (J. Biol. Chem., 1938, 123, 491—497).—Coproporphyrin I and hæmoglobin (type III porphyrin) appear almost simultaneously in the developing chick embryo, and both increase with the period of incubation. Coproporphyrin I is not derived from an exogenous source nor from converted type III porphyrin. The quant. relationship between the two types is discussed. J. N. A.

Typing of blood and seminal stains by means of the absorption test. K. E. LANDÉ (Arch. Path., 1938, 25, 463—473).—In 94.5% of 109 dried blood stains and in 93.6% of dried seminal stains of known group, the group was correctly determined by repeated absorption tests. In the remaining 5.5% of cases incorrect results were obtained, or if only one absorption test was carried out the incorrect results increased to 13% and 12%, respectively. The technique, sources of error, and val. of the absorption tests are described in detail. C. J. C. B.

Isoagglutinin titres in serum disease, in leukaemias, in infectious mononucleosis, and after blood transfusion. L. DAVIDSOHN (Amer. J. clin. Path., 1938, 8, 179—196).—517 normals showed a greater frequency of high titres for anti-*A* isoagglutinins in blood groups *B* and *O*, as compared with anti-*B* isoagglutinins in groups *A* and *O*; there is thus more danger when universal donors with high titres of isoagglutinins are used for type *A* than for type *B* recipients. High agglutinin titres were most common in young people and became less frequent with advancing age. In chronic leukaemia low titres are common, particularly in cases that had not received X-ray therapy. Most cases of acute leukaemia and chronic X-rayed cases showed normal or slightly raised titres. Very high titres were observed in patients with serum disease; such patients should be used to supply high-titre serum for blood group stock tests. In infectious mononucleosis the titres were normal. Blood transfusions did not influence the isoagglutinin titre of the recipient's blood. C. J. C. B.

Blood groups of the Noluas of Bengal. M. N. BASU (Nature, 1938, 141, 649).—100 adult male Noluas showed: group *O* 16%, group *A* 38%, group *B* 33%, group *AB* 13%. C. A. K.

Group-specific hæmolytic reaction after blood transfusion. J. Rø (Acta chir. scand., 1937, 80, 283—294).—A case is recorded of blood transfusion from group *A* to group *O* with subsequent hæmolysis and final recovery. The recipient's serum did not agglutinate the donor's red cells before or immediately after the transfusion. With group *O* cells this serum gave a faint agglutination. The hæmolytic titre of the recipient serum for donor's cells increased from 15 after the transfusion to 70 9 weeks later. The agglutination titre rose to 200 in the first 5 weeks and then fell to 70 in the next 4. This new agglutination property of the recipient's serum was sp. for group *A* and for the donor. The former hæmolysis factor was adsorbed by group *A* cells, while the agglutination factor was adsorbed only by donor cells. The recipient is regarded as belonging to a defective *O* type, containing hæmoglobin α but not agglutinin α . Transfusion caused the appearance of the agglutinin, by its action on the recipient's blood-forming organs, completing this latent group characteristic of the recipient. H. B. C.

Estimation of fragility of red blood corpuscles. E. F. CREED (J. Path. Bact., 1938, 46, 331—340).—Aerated whole blood is mixed with aq. NaCl of varying concns. The % of corpuscles hæmolyzed is determined by matching with colour standards. Allowance must be made for the effect of anæmic conditions in increasing resistance to hypotonic saline. W. L. D.

Fragility of red blood cells: its measurement and significance. J. V. DACE and J. M. VAUGHAN (J. Path. Bact., 1938, 46, 341—356).—One drop of oxygenated blood is mixed with 1 ml. of aq. NaCl ranging from 0.10 to 0.72%. After being kept at 0° for 30 min., the tubes are centrifuged and the red colour of the supernatant liquid is determined colorimetrically against standards made from the original blood. Fragility is related to cell dimensions expressed by the ratio: mean corpuscular thickness/mean corpuscular diameter, an increase in the ratio being attended with increase in fragility. External factors influencing fragility are $[O_2]$ and $[CO_2]$ of blood, temp. and p_H of hæmolytic solution. Anæmia reduces fragility due to increase in plasma content and change in cell vol. W. L. D.

Discussion on the effects of physical treatment on the Arneth count and sedimentation rate in rheumatic conditions. (Proc. Roy. Soc. Med., 1938, 31, 309—330).—H. J. GIBSON: Methods for determining sedimentation rate are reviewed. Cooke-Arneth counts show a significant shift to the left in rheumatoid and osteo-arthritis; in fibrositis, spondylitis, and normals there is no significant shift. The count is not a rigid criterion of rheumatic activity. The sedimentation rate is the best test of progress in rheumatic conditions.

These views were supported by L. C. HILL, D. H. COLLINS, and W. YEOMAN. W. J. G.

Blood picture of infantile pre-beriberi, infantile beriberi, and infantile B-avitaminotic dyspepsia. S. SHIRAI and M. SHINDO (Tôhoku J. exp. Med., 1938, 32, 470—483).—There is no difference in the blood counts in the three states. A. S.

Blood in pellagra. P. TOMESCO, N. G. IONESCO, and P. CONSTANTINESCO (Sang, 1938, 12, 275—298).—The literature is reviewed; 34 new cases are described. The significant findings were a slight increase in the no. of blood platelets and in clot retraction, a great increase in the sedimentation rate, diminution in the fragility of the red cells, hypoproteinæmia with hyperglobulinæmia and hyperpolypeptideæmia. The red cells showed a moderate anæmia but did not fall below 3×10^6 , the colour index varied between 1.4 and 0.65, and anisocytosis was usually present. The blood rapidly returned to normal on suitable treatment in most cases. C. J. C. B.

Immunological reactions following whole blood and omnadin injections. J. F. MAGERL (Wien. klin. Wschr., 1938, 51, 353—357).—The formation of lysins in rabbits to sheep blood corpuscles is enhanced and prolonged by injections of whole blood; if the concn. of hæmolytic amboceptors in serum declines, it can be increased again by injections of whole blood and of omnadin. A. S.

Copper peroxidase reaction of hæmo-histioblasts (Ferrata). S. KIMURA and T. SUZUKI (Tôhoku J. exp. Med., 1938, 32, 460—463).—Ferrata's hæmo-histioblasts give a positive peroxidase reaction. A. S.

Blood pigment, iron, and bile pigments. G. BARKAN (Klin. Woch., 1937, 16, 1266—1268).—A review of labile Fe in blood. F. W. L.

Influence of young red cells on infections of *Plasmodium cathemerium* in birds. R. HEGNER and R. HEWITT (Amer. J. Hyg., 1938, 27, 417—436).—In canaries infected with malarial parasites the young red cells are more susceptible to infection than old cells. Phenylhydrazine hydrochloride increased the infections in birds because more young cells were available to parasitise. As infection proceeds the young cells become more resistant. G. P. G.

Susceptibility of young red cells to the merozoites of avian plasmodia. R. HEGNER and L. ESKRIDGE (Amer. J. Hyg., 1938, 27, 471—492; cf. preceding abstract).—Methods are described of supravital staining the red cells of canaries and pigeons with brilliant-cresyl-blue so as to reveal their comparative age. The cells were counterstained with Giemsa. Five types of red cell were recognised according to the condition of the chromatin in the nucleus, the degree of polychromasia of the cytoplasm, and the quantity of reticulin present in the cytoplasm. Data are presented indicating that in three species of avian plasmodia, *P. relictum*, *P. circumflexum*, and *P. elongatum*, a large percentage of the merozoites enter young red cells. G. P. G.

Radium emanation and cellular metabolism. W. FLEISCHMANN and D. LASZLO (Klin. Woch., 1937, 16, 1248—1251).—The inhibition of the respiration of birds' erythrocytes by Rn is reversible. F. W. L.

Therapeutic action of blood transfusion in infectious diseases. A. BOGOMOLETZ (Sang, 1938, 12, 450—455).—A review. C. J. C. B.

Action of venins on the blood. P. BOQUET (Sang, 1938, 12, 420—426).—A review. C. J. C. B.

Clinical studies of the blood volume. IV. Adaptation of the method to the photo-electric microcolorimeter. J. G. GIBSON, jun., and K. A. EVELYN (J. clin. Invest., 1938, 17, 153—158).—A photo-electric method of determining the dye concn. of serum samples in the plasma vol. (method of Gibson and Evans) is described and comparison with the spectro-photometer method showed it to be accurate within $\pm 2.5\%$. It has the advantages of greater simplicity, economy, speed, and freedom from subjective errors. C. J. C. B.

Blood transfusion in dogs. C. W. BOWER (J. Amer. vet. med. Ass., 1938, 45, 136—144).—In urgent cases, direct transfusion from the heart of the donor to that of the recipient is the most valuable procedure. E. G. W.

Factors influencing blood volume in normal and pathological states. IV—VI. H. OKA (Tôhoku J. exp. Med., 1938, 32, 356—373, 374—381, 382—398).—IV. The blood vol. of rabbits is considerably increased 2 days after ligature of both ureters or double nephrectomy; the red blood cell vol. is unchanged. Blood vol. and red cell vol. are diminished following intravenous injection of normal saline. Blood transfusion increases plasma and red cell vol.

V. Intravenous injection of peptone (6% solution; 5 c.c. per kg. body-wt.) increases the blood vol. of normal rabbits.

VI. Ingestion of $1\frac{1}{2}$ l. of tea diminishes the blood vol. in cases of essential hypertension and of glomerular nephritis. A. S.

Differentiation between various types of hæmorrhage. R. JÜRGENS (Dtsch. med. Wschr., 1938, 64, 629—633).—A review. A. S.

Hypersensitivity to Congo-red. W. WÜLFINGHOFF (Dtsch. med. Wschr., 1938, 64, 566—567).—Generalised urticaria was observed in a patient 30—45 min. after the intravenous injection of Congo-red. The blood count showed 15% eosinophil leucocytes. The condition lasted several days. A. S.

New theories of blood clotting. F. SCHÜRER (Wien. klin. Wschr., 1938, 51, 453—456).—A review. A. S.

Relationship of calcium-ion concentration to the coagulation of citrated plasma. J. C. RANSMEIER and F. C. MCLEAN (Amer. J. Physiol., 1938, 121, 488—494).—The min. $[Ca^{++}]$ effective in promoting the coagulation of blood in the dog is below the min. concn. reported as being compatible with the life of the animal. Increase in $[Ca^{++}]$ above that normally present in the plasma exerts little effect on coagulation time and changes in p_H compatible with life do not alter the coagulation time. M. W. G.

Variables affecting the prothrombin time. P. M. AGGELER and S. P. LUCIA (Proc. Soc. Exp. Biol. Med., 1938, 38, 11—16).—The addition of excess of brain emulsion, or of bile salts, or of heparin, or of Ca to coagulating plasma mixtures may cause a prolongation of coagulation time though the quantity of prothrombin present is const. and thromboplastic substance is present in excess. V. J. W.

Action of rodealin on blood clotting. M. INABA (Folia Pharmacol. Japon., 1936, 21, 292—301).—Rodealin (a prep. of *Rodea japonica*, Ruth.) decreases clotting time and increases fibrinogen and thrombin contents of blood *in vivo* but not *in vitro*. The action is increased by small, but inhibited by moderate, amounts of Ca⁺⁺ or of Na citrate.

CH. ABS. (p)

Occurrence of a substance in marine algæ which inhibits blood-coagulation. II. H. ELSNER (Z. physiol. Chem., 1938, 252, 196—200; cf. A., 1937, III, 250).—The occurrence of a powerful anticoagulant in various species of algæ is recorded.

F. O. H.

Coagulation of the blood in tubes of Pyrex and of Jena glass. C. AUBERTIN (Sang, 1938, 12, 439—444).—Coagulation time is increased considerably in Pyrex glass tubes compared with ordinary glass tubes, and to a smaller extent in Jena tubes. The sedimentation rate shows a slight increase in Pyrex tubes and less in Jena tubes; retraction of the clot is increased when ordinary glass tubes are used.

C. J. C. B.

Substances involved in coagulation of blood of the newborn infant. V. Fibrinogen. M. M. CRANE and H. N. SANFORD. **VI. Prothrombin.** E. I. LESLIE and H. N. SANFORD (Amer. J. Dis. Child., 1936, 51, 311—312, 590—593).—V. Injection of maternal whole blood into newborn infants with hæmorrhagic disease does not increase the fibrinogen content of the infant's plasma.

VI. The increase in coagulation time of blood of newborn infants up to the fourth day is due to increased resistance of the platelets to disintegration. Subsequently the resistance diminishes and disintegration, after 10 days, is greater than at birth.

CH. ABS. (p)

Anaphylactic properties of serum. P. G. CHARPENTIER, M. DOLADILHE, C. MOREL, and L. PLACIDI (Compt. rend., 1938, 206, 383—384).—Euglobulin can be separated from homoglobulin and a viscous protein; the latter alone is concerned with the anaphylactic properties of horse serum. T. F. D.

Inactivation of complement by iodine. B. F. CHOW and S. C. WONG (Proc. Soc. Exp. Biol. Med., 1938, 38, 120—122).—Serum to which varying amounts of 0.01N-I were added was kept at room temp. for 5 min. and then diluted and complement determinations made. The amount of complement inactivated is proportional to the amount of I added and the proportion is a different const. in each species examined, the guinea-pig, rat, and pig. V. J. W.

Changes in blood density in adult man in acute fever induced by typhoid vaccine and malaria. F. T. ROGERS (Proc. Soc. Exp. Biol. Med., 1938, 38, 73—77).—Blood density begins to increase within

$\frac{1}{2}$ hr. of vaccine injection, but returns to normal in 5—6 hr. while the temp. is still rising. V. J. W.

High-molecular crystallisable protein in blood serum in myeloma. B. VON BONSDORFF, H. GROTH, and T. PACKALÉN (Folia Haemat., Lpz., 1938, 59, 184—208).—The serum from a typical case of myeloma with good renal function and absent Bence-Jones protein separated in the refrigerator into a lower viscid layer and an ordinary clear serum layer. From the former, boat-shaped rhombic hemimorphous protein crystals, up to 2—3 mm. in length, formed in a few days. At room temp. the crystals took 10—14 days to form and were needle-shaped. They gave the biuret reaction, were almost insol. in water, saline, alcohol, and ether, but sol. in dil. acids and alkalis, being reprecipitated on neutralisation. They coagulated at 72—75°. The almost completely dried crystals contained C 49.2, H 7.69, N 13.81, and S 0.98%. By diffusion experiments and ultracentrifugation the mol. wt. was approx. 200,000. Preliminary serological pptn. experiments point to the protein not being a normal constituent of serum.

C. J. C. B.

Serum-proteins before and after operations for hyperthyroidism. R. B. BROWN and P. M. MECRAY (Endocrinol., 1938, 22, 302—306).—In 14 out of 24 cases the serum-protein increased after operation by more than 10%, which is taken as the limit of experimental error. There was no significant correlation of serum-protein with age, sex, basal metabolic rate, wt. loss, duration of symptoms, or post-operative wt. gain. V. J. W.

Viscosity of sera and solutions of their proteins isolated with cold acetone. C. ACHARD, A. BOUTARIC, and M. ROY (Compt. rend., 1938, 206, 395—398).—The viscosity, η , of ox, heifer, or bull serum or of aq. solutions of serum-proteins pptd. with acetone is unchanged up to 55° and from 55° to 60° increases rapidly; the latter change is incompletely reversible. If the serum or aq. solution is kept at 60° for 1 hr. and then cooled, η falls as in the cooling stage of the above experiment, but the vals. are greater. The changes in η at 55° are due to intramol. changes in the protein mol. which can occur in the absence of inorg. and lipin substances. J. L. D.

Plasma-proteins in rats after partial hepatectomy and laparotomy. A. CHANUTIN, J. C. HORTENSTINE, W. S. COLE, and S. LUDEWIG (J. Biol. Chem., 1938, 123, 247—256).—Plasma-fibrin and -globulin diminish on the first day after hepatectomy, and then rise to vals. above normal for four weeks, whilst plasma-albumin shows subnormal vals. Immediate increases in plasma-fibrin and -globulin occur after laparotomy together with a decrease in -albumin. The main effect of both tissue injury and reduction of amount of liver tissue is the prolonged decrease in plasma-albumin accompanied by increased -globulin.

T. F. D.

(A) **Crystallisable albumin fraction of horse serum.** R. A. KEKWICK. (B) **Serological properties of the albumin fractions.** P. G. H. GELL and M. E. YUILL (Biochem. J., 1938, 32, 552—560, 560—562).—(A) Globulins were first removed by addition of 20% of Na₂SO₄. The p_H was then

adjusted to 4.8—4.9 with 0.2N-H₂SO₄ and Na₂SO₄ again added to maintain the concn. at 20%. The cryst. ppt. was removed after 24 hr. and separated into two fractions (A and B) by fractional extraction with distilled water. Fractions A and B contained N 14.35 and 15.16, carbohydrate 1.95 and 0.083, and ash 0.38 and 0.23%, respectively, but they could not be differentiated by means of their sedimentation and diffusion consts. or electrophoretic mobilities.

(B) Fraction B appears to be lacking in an antigenic component possessed (to equal extents) by A and the recryst. albumin. P. G. M.

Blood-plasma and urea. W. DIEBOLD (Z. physiol. Chem., 1938, 252, 115—116).—At approx. 4°, aq. urea denatures fibrinogen solutions slowly or not at all and preserves them unchanged for months. The fibrinogen of oxalated plasma, however, is changed in a few days by urea into a globulin-like substance not pptd. by heat at 53—54°, by half-saturation with NaCl, or by thrombin. Fibrinogen pptd. by NaCl and added to plasma containing added urea is changed in the same way but the fibrinogen of "artificial plasma" obtained by mixing serum and fibrinogen solutions both containing added urea remains unchanged, as does fibrinogen added together with urea to oxalated plasma from which the fibrinogen has been removed by pptn. with NaCl. The properties of the altered fibrinogen are analogous to those of the non-coagulable fibrinogen from persons who have died suddenly. W. McC.

Protein studies in atrophic (rheumatoid) and hypertrophic arthritis. J. S. DAVIS, jun. (J. lab. clin. Med., 1936, 21, 478—489).—Plasma-protein fractions show little change in hypertrophic arthritis, but in atrophic arthritis there is an increase in globulin and euglobulin, a smaller increase in fibrinogen, and a decrease in albumin fractions.

CH. ABS. (p)

Critical temperature of blood serum. (Behaviour of serum-proteins as a function of temperature and mechanism of coagulation.) L. DU NOÛY (Compt. rend. Trav. Lab. Carlsberg, 1938, 22, 391—397).—The destruction of "complement" when blood serum is heated to 57° is accompanied by increases in viscosity, rotatory power, light absorption, scattering of light, electrical resistivity, depolarisation factor, and p_H , whilst stability and rate of sedimentation of globulins are profoundly modified. The power of fixation of ether is decreased, and the interfacial tension against paraffin oil is altered. A hypothesis of hydration of the proteins at 55—57° is advanced which explains the facts. J. N. A.

Urea-nitrogen content of blood following anaesthesia. E. A. BOYD (Brit. J. Anaesthesia, 1936, 15, 56—65).—No consistent changes were noted. CH. ABS. (p)

Determination of residual nitrogen in blood without distillation. F. RAPPAPORT (Klin. Woch., 1937, 16, 1190—1191).—Details of method for 0.1—0.2 c.c. of blood or serum are given. F. W. L.

Porphyrins in a case of porphyria with out porphyrinuria. W. GROTEPASS and A. DEFALQUE (Z. physiol. Chem., 1938, 252, 155—162).—The faeces

and probably also the bile contained proto- and mesoporphyrin IX and coproporphyrin I and III; the last two were detected in the urine, which contained the normal amounts of porphyrin pigments.

F. O. H.

Colorimetric determination of adrenaline in blood. S. KOBAYASHI (Japan. J. Med. Sci. IV., 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 152—154).—The Folin, Cannon, and Denis method produces a blue coloration with Na tungstate. Uric acid gives a similar colour. With phosphotungstic acid adrenaline gives a violet colour proportional to the adrenaline content of the blood. Test samples should contain at least 0.2 mg. of adrenaline per 100 g. Only quinol and vitamin-C give similar colours. Blood from ear veins (rabbit) contains 73.5 and carotid blood 323 µg. per litre. CH. ABS. (p)

Mechanism of increase of blood-ammonia. H. E. SHIH (J. Urol., 1936, 25, 82—85).—Injection of urea into the large intestine in rats increases blood-urea and, more markedly, -NH₃. Ligation of the inferior vena cava or removal of kidneys causes less pronounced changes. CH. ABS. (p)

Micro-determination of glycogen in blood. A. M. GENKIN (Biochimia, 1938, 3, 47—58).—Minor modifications of Simonovits' method (A., 1934, 122) are described. R. T.

Convulsion threshold in hypoglycaemic shock. Z. WECHSLER (Nervenarzt, 1938, 11, 129—131).—In rabbits the convulsion threshold to cardiazole is lowered by hypoglycaemia induced by insulin. C. A. K.

Hyperglycaemic response to hypoglycaemia in diabetic and in healthy individuals. M. SOMOGYI (Proc. Soc. Exp. Biol. Med., 1938, 38, 51—55).—In normal individuals hypoglycaemia however caused is followed by some hyperglycaemia. In the diabetic this tendency is much increased. V. J. W.

Influence of sinomenine, parasinomenine, and the reduction products of the former on blood-sugar in rabbits. H. KOIKE (Folia Pharmacol. Japon., 1936, 21, 347—358).—The two drugs and also dihydrosinomenine in small doses cause hypo- and in larger doses a hyper-glycaemia. Demethoxy-dihydro-sinomeninol and -isoinomeninol produce hyperglycaemia regardless of dosage. Deoxytetra-hydrosinomenine in small doses causes hyper- and in large doses hypo-glycaemia. The methoxyl group in the 7-position in sinomenine and dihydrosinomenine appears to be responsible for the hyperglycaemic effect. CH. ABS. (p)

Blood-sugar during menstruation. T. S. AUERBACH (Arch. int. Méd. exp., 1937, 12, 419—435).—After glucose administration during menstruation, the blood-sugar curves of fat women are lower, and of muscular women higher, than during the intermenstruum. This is attributed to insufficient production of adrenal hormone (the antagonist to insulin) in the first group during menstruation and to relatively greater efficiency of the adrenal cortex in the second. H. R.

Blood-sugar in the carp (Cyprinidae). H. VORHAUER (Biochem. Z., 1938, 296, 90—98).—The

sugar content of the blood of fasting tench (*Tinca vulgaris*, Cuv.) and carp (*Cyprinus carpio*, L.) varies from 50 to 240 mg.-%. The content is increased, sometimes 3-fold, by injury to or section of the spine between the caudal and the anal fin or, sometimes 5-fold, by injection of adrenaline, which also causes whitening of the skin. Injected insulin very greatly decreases the content but produces no convulsions; no detrimental effects were observed in tench with a blood-sugar of 12 mg.-%. The effects of insulin and adrenaline persist for several days. The blood-sugar is not affected by injection of thyroxine or phloridzin but phloridzin causes glycosuria. W. McC.

A measure to alter the glycæmic effect of histamine and peptone. Y. SATOW (Tôhoku J. exp. Med., 1938, 32, 239—256).—If histamine (0.4—0.5 mg. per kg. body-wt.) or Witte's peptone (0.1—0.7 g. per kg. body-wt.) is injected rapidly (in 5—20 sec.) intravenously into rabbits, the blood-sugar rises; if they are given slowly (in 1—5 min.) it decreases. Subcutaneous injection of 1—2 mg. of histamine per kg. body-wt. or 0.2—0.7 g. of peptone always lowers the blood-sugar. A. S.

Blood buffer values in mineral deficiency. I. N. KUGELMASS (Amer. J. digest. Dis. Nutr., 1936, 2, 730—732).—Blood buffer capacity was subnormal in rickets. The buffer capacity of normal serum is greater on the alkaline than on the acid side in the range p_H 5.0—8.5 and is markedly accentuated at wider ranges of p_H . CH. ABS. (p)

Effect of the ratios lipin : protein and albumin : globulin on the cholesterolytic power [of blood]. J. DESBORDES, P. BOULENGER, and D. LÉVY (Compt. rend. Soc. Biol., 1938, 127, 781—783).—The cholesterolytic power of serum depends mainly on the albumin-globulin equilibrium. H. G. R.

Interrelation between lipins in blood of normal rabbits. E. M. BOYD (Canad. J. Res., 1938, 16, D, 31—37).—Plasma-lipin in rabbits averaged approx. half that of man and vals. were more variable. Red cell-lipin was similar in all respects in man and rabbits. All lipins in rabbit plasma increased uniformly with the total, but in the red cells only phospholipin and cholesterol followed this rule, neutral fat and cholesterol esters showing irregular changes. Blood-lipin in rabbits was unrelated to sex, body-wt., season, or blood-hæmoglobin. A. G. P.

Anæsthesia and blood-lipins. E. M. BOYD (Surg. Gynecol. Obstet., 1936, 62, 677—683).—Blood-lipins decreased after N_2O -ether anæsthesia, due to diminution of neutral fat and phospholipin in red cells and of neutral fat in plasma. Subsequent lipæmia (24 hr.) involved increases in neutral fat, phospholipin, and cholesterol in red cells. During the lipopenia plasma contained more unsaturated and during the lipæmia more saturated phospholipins, red cells discharging saturated phospholipins during the lipopenic period. Anæsthesia affects sterol metabolism independently of that of lipins. CH. ABS. (p)

Composition and precipitation reactions of normal serum. C. G. ANDERSON (Biochem. J., 1938, 32, 282—285).—Compounds sol. in alcohol but

not in water (saturated mono- and di-basic acids, unsaturated acids, salts, glycerides in 1% alcoholic solution) give pptn. reactions with serum similar to those obtained with naturally occurring lipins, the degree of pptn. being proportional to the degree of polarity of the compounds. Little or no pptn. is produced by paraffins, olefines, primary and sec. alcohols, esters, or sterols. The C type of reaction is given by fatty acids, the A_2 type by the other compounds. Cetyl alcohol gives the B reaction.

W. McC.

Fats of human blood. C. P. STEWART and E. B. HENDRY (Edinb. med. J., 1936, 43, 99—107).—In pernicious anæmia low lipin-P in blood is due entirely to low cell vol., and vals. for hæmoglobin and lipin-P are closely parallel. In diabetes the total fat acid, cholesterol, and (at times) phospholipins in whole blood increase, the change in fat acids occurring in non-phospholipin fractions, free fat acids, or triglycerides. No change in cell vol. is involved. CH. ABS. (p)

Fatty acid and cholesterol content of the blood of the marine lamprey (*Petromyzon marinus*, L.). M. FONTAINE and A. DRILHON (Compt. rend. Soc. Biol., 1938, 127, 770—771).—The fatty acid of the blood decreases as the season advances whilst the cholesterol content is approx. 0.0015%. H. G. R.

Formation of phosphatides in blood. L. HAHN and G. HEVESY (Compt. rend. Trav. Lab. Carlsberg, 1938, 22, 188—192).—When dog's blood is shaken with radioactive Na phosphate for 4.5 hr., 0.3 mg.-% of radioactive phosphatide is formed. No difference was found in amounts of phosphatide formed in normal and lipæmic blood. More active phosphatide is formed in corpuscles than in plasma, but some is formed in plasma in absence of corpuscles. It is concluded that phosphatide formed in blood is only very slightly responsible for alimentary lecithinæmia. J. N. A.

Lipins of the blood plasma in hay fever and asthma. II. Unsaturated fatty acids in the fat, phospholipin, and cholesterol esters. W. R. BLOOR, A. G. BLAKE, and S. S. BULLEN (J. Allergy, 1938, 9, 227—233).—14 patients with asthma, 11 with hay fever, 1 each with contact dermatitis and chronic urticaria, and 5 normal controls were examined. No differences in the nature of the fatty acids in these groups were found. Marked differences were present in the degree of unsaturation of the fatty acids in the 3 groups of compounds, the fatty acids being much more unsaturated in the cholesterol esters than in the phospholipins and neutral fat, and somewhat more unsaturated in the phospholipins than in the fat. These results indicate a special function of cholesterol in relation to the metabolism of the unsaturated acids. C. J. C. B.

Serum-cholesterol in allergy. R. CHOBOT and H. D. DUNDY (J. Allergy, 1938, 9, 231—233).—Blood-cholesterol was determined in 35 allergic and 25 non-allergic children by the Sackett-Bloor method. In the former the range was 115—305 mg.-% (average 196 mg.), in the latter 120—200 mg. All children with vals. over 200 mg. were given thyroid extract by mouth without benefit. Blood-Ca (Clark-Collip method) was 9—11.6 mg. (average 10.6 mg.) and -P

(Benedict-Theis) was 3.5–10 mg. (average 5.6 mg.) in the allergic; in the non-allergic children the ranges were 9.6–11.3 and 4.4–5.2 mg., respectively. The significance of the high P in the allergic group is unknown.
C. J. C. B.

Blood-phosphatase: clinical significance. A. YAGUDA (Amer. J. clin. Path., 1936, 6, 57–65).—Phosphatase activity is markedly increased in Paget's disease, active rickets, and obstructive jaundice.
CH. ABS. (p)

Analysis of blood-serum carotenoids. J. C. LANZING (Med. Dienst. Volks. Ned.-Indië, 1938, 27, 213–223).—10 c.c. of serum are hydrolysed with KOH-alcohol and the carotenoids extracted with light petroleum (b.p. 40–60°). The solution is then submitted to microchromatographic separation on Al_2O_3 (described in minute detail) and compared with standards made from mixtures of α -, β -, and γ -carotene and cryptoxanthin. Definite rings are produced with 0.5–1 μ g. of a particular carotene and these are removed in sequence with mixtures of light petroleum and benzene of definite composition. Analyses for vitamin-A, α -, β -, and γ -carotene, lycopene, cryptoxanthin, and xanthophyll contents of the blood of a no. of native prisoners, fed on a provitamin-A-rich diet, and a no. of Europeans in Java are given. In spite of the low intake of -A the prisoners produced sufficient in their blood from provitamins. The composition of blood-carotenoids depends on the carotenoid content of the food. Natives and Europeans have approx. the same -A level. The question of the rôle of cryptoxanthin is discussed. Blood sera of equal total carotenoid contents may differ considerably in actual composition.
S. C.

Phenol content of normal blood. S. TOKUYAMA (J. Biochem. Japan, 1938, 27, 119–140).—The average free phenol contents of arterial and venous blood are 1.13 and 0.9 (toad) and 1.69 and 1.4 mg. per 100 c.c. (rabbit), respectively. The content of conjugated phenols (average 0.12 and 0.27 mg. per 100 c.c. in arterial blood of toad and rabbit, respectively) varies to a greater extent than does the free phenol level. The reason for the existence of free phenols in the blood, the constancy of their level, and the part played by phenols in the increased muscular contraction due to injection of ultrafiltrates of serum are discussed.
F. O. H.

Distribution of sodium chloride and glucose between the plasma and vitreous humour of *Octopus vulgaris*, Lmk., and *Sepia officinalis*, L. Y. DERRIEN (Compt. rend. Soc. Biol., 1938, 127, 1011–1014).—The ratio of NaCl in the vitreous humour to that in the plasma is 1.05, whilst that of glucose is very variable, the mean val. being 1.06.
H. G. R.

Quantitative studies on the replacement of body-chlorides. R. M. BARTLETT, D. L. C. BINGHAM, S. PEDERSEN, W. G. MADDOCK, and F. A. COLLIER (Proc. Soc. Exp. Biol. Med., 1938, 38, 89–92).—From data gained by the administration of NaCl to 10 surgical patients with lowered blood-Cl' it was found desirable to administer 0.5 g. of NaCl per kg. body-wt.

for each 100 mg. per 100 c.c. that the plasma-chlorides were below normal.
V. J. W.

Erythrocyte-plasma partition of organic medicaments. P. CHERAMY and E. CLICHE (J. Pharm. Chim., 1938, [viii], 27, 321–324).—The partition between plasma and erythrocytes was determined in the rabbit after administration of Na benzoate, antipyrine, Na salicylate, caffeine, aspirin, and Na evipan. The aspirin, salicylic acid, and caffeine contents of various organs were determined after administration.
T. F. D.

Changes in the blood following repeated withdrawal of ascitic fluid in cirrhosis of the liver. A. CANTAROW (Amer. J. clin. Path., 1938, 8, 142–145).—In 5 patients in the terminal stages, the serum-protein concn. diminished immediately after paracentesis and increased subsequently. Serum-Cl also fell, the degree of Cl deficit being marked by haemoconcentration. Serum-K increased from normal to 29.4–32.4 mg.-% at the end of the period of observation. The marked disturbance in water balance and electrolyte distribution may have a bearing on the development of toxic symptoms in the patients. Repeated paracentesis, diuresis by NH_4 salts, high-carbohydrate, low-Na, low-Cl, and relatively high-K diet, which are effective in less severe cases, only aggravated the serum-protein deficit, haemoconcentration, hypochloræmia, and hyperpotassæmia in these more severe cases.
C. J. C. B.

Distribution *in vitro* of chloride between the plasma and the erythrocytes. M. M. LÉVY, and S. MIGNON [with M. HAFFNER] (Bull. Soc. Chim. biol., 1938, 20, 145–158).—Addition of aq. NaCl or serum containing glucose to blood *in vitro* causes no change in the NaCl content of the erythrocytes.
A. L.

Magnesium content of serum after injection of prolan. S. BORGSTROEM (Skand. Arch. Physiol., 1938, 78, 73–75).—Subcutaneous injection of prolan in rabbits does not influence the serum-Mg.
A. S.

Determination of magnesium in serum. S. BORGSTROEM (Skand. Arch. Physiol., 1938, 78, 65–72).—Denis' method is modified for accurate determinations of Mg in 2 c.c. of serum.
A. S.

Effect of iodine on blood-calcium. K. VON MEGAY (Klin. Woch., 1937, 16, 1254–1255).—I (1 mg. per kg.) given perorally or intramuscularly increases blood-Ca in dogs and men.
F. W. L.

Is the blood-calcium level of mammals influenced by oestrogenic substances? L. LEVIN and P. E. SMITH (Endocrinol., 1938, 22, 315–321).—No such effect could be found in normal and ovariectomised adult rats or rabbits or in normal immature monkeys.
V. J. W.

Determination of silicon in blood. H. WEIL (Arch. exp. Path. Pharm., 1938, 188, 377–382).—An emission spectroscopic method was used. When silicates were added to blood the most reliable results were obtained in the range of 0.1–1.0 mg.-% Si. The vals. found in whole human blood were below 0.1 mg.-% both in normal subjects and in cases of silicosis.
H. O. S.

Organically bound bromine of blood. H. DOERING (Biochem. Z., 1938, 296, 53—55; cf. A., 1937, III, 292).—Since whole blood (human, cattle) contains org. Br converted into inorg. Br by conc. HNO_3 at 250° but not at 100° an explanation is provided of the low results obtained when destruction of org. matter is carried out in an open vessel.

W. McC.

Lymphagogenic action of dyes, Indian ink, and colloidal metals. Rôle of the reticulo-endothelial system. E. CZARNECKI (Acta Biol. Exp., 1937, 11, 276—280).—Production of thoracic lymph is greatly increased in dogs by intravenous injections of trypan-blue, methylene-blue, carmine, isamine-blue, or colloidal Ag or Au in amounts sufficient to cause blocking of the reticulo-endothelial system. The effect is accompanied by a considerable fall in arterial and venous blood pressure, corresponding with that observed in peptone or histamine shock. As a result of peripheral vascular distension with consequent increase in permeability of the endothelium, plasma constituents, and even erythrocytes, pass the blood-lymph barrier and lead to increased lymph production.

R. T.

Formation of tissue fluid and lymph. J. MELKA (Klin. Woch., 1937, 16, 1337—1340).

(c) VASCULAR SYSTEM.

Metabolism of the Frog's Heart. A. J. CLARK, M. G. EGGLETON, P. EGGLETON, R. GADDIE, and C. P. STEWART (Oliver and Boyd, 1938, 297 pp.).—This important monograph is mainly a summary of 10 years' researches by the authors. The structure and chemical composition of the heart are described and factors influencing O_2 usage of the perfused isolated heart are discussed. The oxidation of carbohydrate provides about 50%, of protein about 25%, and of fat about 10% of the energy for contraction under aerobic conditions. Cardiac activity under anaerobic conditions depends on the maintenance of an alkaline perfusion fluid + an adequate supply of carbohydrate. The effects of inhibition of glycolysis by iodoacetate, the effects of asphyxia, and the action of depressants are discussed, and the relations between electrical and mechanical responses and metabolism are fully considered. Finally the metabolism of cardiac muscle is compared with that of plain and skeletal muscle. Technical procedures are described in an appendix.

C. A. K.

Blood-histamine and cardiac activity. C. F. CODE, C. L. EVANS, and R. A. GREGORY (J. Physiol., 1938, 92, 344—354).—No evidence for the production of histamine by the dog's heart was found either in the heart-oxygenator or in heart-lung preps. The reason why these results differ from those of Anrep *et al.* is not known.

J. A. C.

Total creatinine, phosphates, calcium, and potassium in normal and infarcted myocardium of the dog. G. HERRMANN and P. ERHARD (Proc. Soc. Exp. Biol. Med., 1938, 38, 35—37).—Infarcted muscle as compared with normal contains less creatinine and lipin phosphate but the same quantities of inorg. phosphate, K, and Ca.

V. J. W.

Variation in creatine content of human cardiac and voluntary muscle at autopsy. C. R. LINEGAR, T. T. FROST, and V. C. MYERS (Arch. Int. Med., 1938, 61, 430—450).—There is a higher creatine concn. in the left than in the right ventricle of the dog. The cardiac creatine concn. is higher in the dog than in man, but the difference between the two ventricles is smaller. Perfusion of the dog's heart with Locke's solution through the descending coronary artery reduces the creatine content of the perfused area. The creatine content of the heart of an infant is low at birth and progressively increases to adult vals. within a few months after birth; it is lowered in cardiac decompensation.

T. H. H.

Diffusion of acetylcholine from the heart of *Helix pomatia*. M. BOUCHET, A. JULLIEN, D. VINCENT, and M. VUILLET (Compt. rend., 1938, 206, 460—462).—The ventricle immersed in eserinated Ringer's fluid loses acetylcholine, the amount increasing with the duration of contact till a max. of 0.3×10^{-3} mg. per g. is lost. The muscle still contains about 2.1×10^{-3} mg. of acetylcholine per g.

J. L. D.

Action of adrenaline and sympatol on the lactic acid metabolism of the heart. F. GOTTDENKER and G. DE MARCHI (Klin. Woch., 1937, 16, 1282—1284).—In heart-lung preps. a single large injection of adrenaline markedly increases blood-lactic acid. Injection of sympatol, producing a similar coronary dilation, has much less effect.

F. W. L.

Difference between natural and artificial stimulation of frog's heart. H. WITZ (Z. Biol., 1938, 98, 551—560).—Local anaesthesia of the atrium or sinus of the frog's heart abolishes the response to locally applied electric shocks, but the automatic activity of the heart remains unaltered.

B. K.

Action of constant current on the isolated (A) beating ventricle, (B) quiescent ventricle, of the mussel (*Mytilus galloprovincialis*). A. JULLIEN and H. MARDUEL (Compt. rend. Soc. Biol., 1938, 127, 319—322, 322—325).—(A) With the indifferent electrode as the anode, closure of the current inhibits the heart; opening the current causes acceleration. If the indifferent electrode is the cathode, the reverse effects are produced.

(B) With the indifferent electrode as anode, closing the current decreases tone; increasing the current produces a single contraction or a rhythmic response. With the indifferent electrode as cathode, the reverse effects are produced.

D. N.

Bradycardia in aortic stenosis. K. SCHNEYER (Z. Kreislaufforsch., 1938, 30, 161—171).—There is no relation between heart rate and systolic blood pressure in aortic stenosis. The bradycardia of patients with aortic stenosis is not reflexly caused via the pressor-receptor nerves.

A. S.

Size of the heart in young athletes. A. HERZUM (Z. Kreislaufforsch., 1938, 30, 197—204).—Bernuth's formula (body length \times chest width) \div (heart width \times heart length) was used in the examination of young athletes. The optimal index is 28 to 32.

A. S.

Changes with age in the cardiac output in adult men. W. A. LEWIS, jun. (Amer. J. Physiol.,

1938, 121, 517—528).—For the age period 40—89 years the cardiac index (cardiac output per sq. m. body surface per min.) follows the equation: cardiac index = $2.49 - 0.0035 \times \text{age}$. The decline in cardiac index follows chiefly on the decline in O_2 consumption, the influence of arterio-venous O_2 difference being relatively small. M. W. G.

Circulation time and distribution of chloride in blood. A. EPSTEIN and M. QUÉLOZ (Schweiz. med. Wschr., 1938, 68, 312—313).—There is no relation between circulation time and distribution of Cl' in red blood cells and plasma. A. S.

Minute and stroke volume of heart. J. KAUP and A. GROSSE (Klin. Woch., 1937, 16, 1201—1204, 1233—1238).—A discussion. F. W. L.

Tests of cardiac efficiency. H. W. KNIPPING (Dtsch. med. Wschr., 1938, 64, 433—436).—A review. A. S.

Test of circulatory efficiency. F. SCHELLONG (Münch. med. Wschr., 1938, 85, 447—449).—The duration of the QRS complex before and after effort is a useful test of cardiac efficiency. A. S.

Respiratory arrhythmia during oxygen-lack. A. J. ANTHONY and W. HARLANDT (Z. Kreislauf-forsch., 1938, 30, 241—246).—Respiratory arrhythmia was studied in 13 healthy subjects with Fleisch's pulse interval recorder under conditions of gradually lowered barometric pressure in a chamber. Heart rate increases and the respiratory arrhythmia disappears at pressures corresponding with an altitude of 3000—5000 m. Breathing of O_2 restores the arrhythmia. The phenomenon is attributed to diminished vagus tone. A. S.

Observations in man on a pulse-accelerating reflex from voluntary muscles of legs. M. ALAM and F. H. SMIRK (J. Physiol., 1938, 92, 167—177).—Accumulation of metabolites formed during muscular exercise is secured by exercise of a leg, the circulation of which has been arrested by means of an inflated sphygmomanometer cuff. The accumulation causes discharges of nerve impulses from the leg muscles, producing reflexly acceleration of the pulse, increase of blood pressure, and pain. Using a small group of muscles (forearm, foot) the acceleration of the pulse is usually absent, the other two effects still being obtained. J. A. C.

Electrical axis of the heart. R. FROELICH (Z. Kreislaufforsch., 1938, 30, 251—257).—Einthoven's projection law (the action potentials led off from the corners of a triangle are proportional to the projections of the electrical axis of the heart on the sides of the triangle) is valid only on the assumption of a spatially unrestricted area. The term "electrical axis" has no bearing on the actual potentials occurring in the heart. A. S.

Artefacts in electrocardiograms recorded with condensers. E. UNDRITZ (Dtsch. med. Wschr., 1938, 64, 442—443).—String galvanometers using condensers may record artefacts (negative or biphasic T waves, deep S, deviations of S-T) which can be abolished with a compensating device. A. S.

Electrocardiogram of guinea-pig. C. L. G. PRATT (J. Physiol., 1938, 92, 268—272).—The records were taken from conscious animals by a method involving a min. of restraint and discomfort. Wide variations are met with in the shape of the deflexions and their time relations; this animal's heart is subject to variations in the initiation and conduction of the excitatory process. J. A. C.

Four-lead electrocardiogram in cases of recent coronary occlusion. A. BOHNING and L. N. KATZ (Arch. Int. Med., 1938, 61, 241—284).—Lead IV, a precordial lead taken from the fourth interspace to the left of the sternum, helped in the diagnosis of recent myocardial infarction due to coronary occlusion, especially anterior infarction. T. H. H.

Course of hypertensive heart disease. III. Significance of bundle-branch block. N. FLAXMAN (Ann. intern. Med., 1938, 11, 1607—1612).—Bundle-branch block was seen in the electrocardiograms of 36 (4.58%) of 786 patients with hypertensive heart disease. C. A. K.

Action of accelerator nerves on idio-ventricular rhythm. F. JOURDAN and R. FROMENT (Compt. rend. Soc. Biol., 1938, 127, 317—319).—After destruction of the bundle of His, stimulation of the stellate ganglion increased frequency of the auricle and the ventricle, the latter sometimes more markedly, proving that the sympathetic nerves to the ventricle do not pass through the bundle of His. D. N.

Transient, recurrent, complete left bundle-branch block. L. F. BISHOP (Amer. Heart J., 1938, 15, 354—357).—Transient, recurrent, complete left bundle-branch block was seen in a man aged 68 who had no signs of heart disease (cf. A., 1938, III, 267). C. A. K.

Case of auriculo-ventricular block. B. KISCH (Cardiologia, 1938, 2, 47—55).—A gradual increase of the auricular interval following a ventricular complex was observed in a case of a complete auriculo-ventricular block with a ventricular rate of 24 per min. The lengthening of the auricular periods is attributed to a reflex increase of vagal tone via the pressor-receptor nerves, produced by the increase of blood pressure following the rare ventricular contractions. A. S.

Localisation of bundle-branch blocks. F. HERLES, P. LUKL, B. PRUSÍK, and H. ŠIKL (Cardiologia, 1938, 2, 1—46).—Detailed clinical, pathological, and histological reports are given of 3 patients with bundle-branch block. The electrocardiograms of these cases were typical for block of the right bundle of His, according to the classical nomenclature. Careful histological examination of the entire conducting system of the heart revealed in all 3 cases a total interruption of the left bundle of His; the right bundle of His was intact in one of these cases. A. S.

Unusual causation of Adams-Stokes syndromes. P. BRANDENBURGER (Z. Kreislauf-forsch., 1938, 30, 246—251).—3 cases are recorded with Adams-Stokes syndrome reflexly produced by

the pressure of an enlarged parotid gland on the carotid sinus. A. S.

Electrocardiographic patterns in acute pericarditis. S. BELLET and T. M. McMILLAN (Arch. Int. Med., 1938, 61, 381—400).—The electrocardiographic findings in 57 cases of acute pericarditis of different aetiological types are presented and discussed. T. H. H.

Kymographic and electrocardiographic studies on athletes' hearts. I. H. REINDEL (Dtsch. Arch. klin. Med., 1938, 181, 485—514).—The heart was not enlarged, except for a small increase in length, in 29% of the all-round athletes examined and in 44% of long-distance runners, in spite of excessive competitive sport activities; long-distance runners and members of football teams may develop mainly an enlargement of the right ventricle, all-round athletes an enlargement of the left ventricle, and long-distance cyclists the greatest enlargement of both ventricles. A. S.

Electrocardiogram in left ventricular hypertrophy and effect of digitalis on S-T waves. E. DUNIS, H. HECHT, and C. KORTH (Dtsch. Arch. klin. Med., 1938, 181, 539—559).—3 types of electrocardiograms are found in left ventricular hypertrophy: (1) T_1 and S-T positive; prognosis satisfactory; (2) S-T starts below isoelectric line and descends in a convex curve; T_1 biphasic or negative; prognosis serious; (3) S-T as in (2); but descends in a concave curve; this type is produced in (2) by digitalis or coronary insufficiency. Deep S_2 with lengthening of the Q-T interval is not a reliable sign of left ventricular hypertrophy. A. S.

Clinical significance of extra-systoles. L. VON UNGHÁRY (Dtsch. med. Wschr., 1938, 64, 563—564).—The electrocardiograms and clinical findings in 216 patients suffering from extra-systoles show in 81.5% definite signs and in 11.5% probable signs of myocardial changes. A. S.

Origin of extra-systoles and interference of two rhythms. P. ECKEY (Dtsch. Arch. klin. Med., 1938, 181, 229—256).—Three patients had ventricular extra-systoles together with persistent sinus rhythm. The extra-systoles disappeared on increasing vagal tone (digitalis, pressure on carotid sinus, doryl); they returned after atropine. A. S.

Auricular "tremulation" (disorder of rhythm intermediate between fibrillation and flutter). C. LIAN and B. PINCHENSON (Cardiologia, 1938, 2, 56—70).—The right arm electrode was placed on the manubrium sterni, the left arm electrode on the right 5th intercostal space near the sternum. This lead is recommended for studies of disturbances of auricular rhythm. Auricular "tremulation" is described, which is not demonstrable with the routine leads. The average frequency of the auricle is 400 per min. Differences in duration of auricular systole occur to the extent of 0.03 sec. Auricular "tremulation" leads to complete ventricular arrhythmia. A. S.

Acute circulatory failure. E. RISAK (Wien. klin. Wschr., 1938, 51, 377—382).—A review. A. S.

Origin of the first heart sound. H. LAURELL (Z. Kreislaufforsch., 1938, 30, 209—217).—The sudden increase of blood velocity in the coronary veins during the isometric phase of ventricular contraction is an important factor in the production of the first heart sound. A. S.

Heart and oxygen lack. L. BINET, M. V. STRUMZA, and J. H. ORDÓÑEZ (Arch. mal. cœur, 1938, 31, 11—16).—Heart rate, blood pressure, and respiration were studied in chloralosed dogs breathing O₂-poor mixtures from a spirometer. O₂-lack corresponding with a height of 8000 m. produces tachycardia (up to 200 per min.), arterial hypertension of 180—200 mm. Hg, and increase of rate and amplitude of respiration. The T wave of the electrocardiogram is inverted. O₂-lack corresponding with a height of 15,000 m. may cause standstill of the heart preceding the respiratory arrest. The electrocardiographic changes observed under conditions of extreme anoxia were: disappearance of P, diminution of R and S, extreme bradycardia, nodal rhythm. Sudden return to normal air produces tachycardia of 220—240 per min. and arterial pressures of 300 to 400 mm. Hg; normal conditions are restored 30 min. later. A. S.

Rein's thermostromuhr for small flows. J. F. HERRICK, E. J. BALDES, and F. P. SEDGWICK (J. Appl. Physics, 1938, 9, 124—127).—An experimental curve of velocity (0—2.69 c.c. per min.) against galvanometer deflexion has been made for Rein's thermostromuhr using Ringer's solution. For velocities up to 0.08 c.c. per min., deflexion increases, but above this val. decreases with increasing velocity. The method is unsuitable for changes in flow which occur in less than 60 sec. (the time required for reaching thermal equilibrium). A theoretical discussion is appended (A. C. BURTON, p. 127—131). E. M. W.

New electric flow recorder. E. HOLZLÖHNER (Z. Biol., 1938, 98, 533—535).—A fine glass needle carrying a Pt wire is inserted perpendicularly into a blood vessel; an a.c. is sent through the blood vessel by 2 electrodes which make contact, at equal distances, on either side of the needle. The needle is connected in series with a galvanometer and a Wheatstone bridge. Displacements of the needle by the blood flow are accompanied by deflexions of the galvanometer. B. K.

Stream cannula and electric recording arrangement. G. BERGMANN (Z. Biol., 1938, 98, 536—543).—The method described in the preceding paper is further elaborated. Cannula, oscillator, amplifier, and calibration curves are described. Curves of blood flow velocity were obtained from the carotid artery and jugular vein of cats and rabbits. B. K.

Action of creatine and creatinine on circulatory system. B. G. SHAPIRO (J. Physiol., 1938, 92, 178—182).—Creatine and (to a greater extent) creatinine produce an increase in amplitude of the beat of the perfused isolated heart of *Xenopus laevis*, rabbit, and cat. A 50% increase is produced by a 1:500 solution of creatinine in toads and by a 1:1000 solution in rabbits and cats. Both substances produce a slight dilatation of the blood

vessels in perfused pithed toads. They may assist to a slight extent in producing the cardiovascular changes of muscular exercise. J. A. C.

Postural disturbances of circulation. B. EWERT (*Cardiologia*, 1938, 2, 107—125).—Two kinds of clinical postural hypotension are described: one group shows no changes of the electrocardiogram when the patient passes from the recumbent to the standing position; other patients show under these conditions flattened T_2 and T_3 and a shortening of the $S-T$ interval. These changes are attributed to an increase of sympathetic tone. A. S.

Application of cellular physiology to medicine. E. DICKER (*J. Physiol. Path. gén.*, 1937, 35, 969—984).—Four cases showing cedema, albuminuria, and skin eruptions, due to nephritis, allergy to potato-protein, syphilis, and bilateral tuberculosis, respectively, are considered to have a common aetiology, viz., a generalised alteration of the permeability of the endothelium of the arterioles and capillaries. C. A. A.

Action of ultra-violet rays on arterial-venous anastomoses. L. KRAUSSE (*Z. Kreislaufforsch.*, 1938, 30, 193—196).—Ultra-violet irradiation over 30 min. produces a general opening up of the arterial-venous anastomoses in the ears of rabbits; this sets in after 4 hr. and disappears after 12 hr. This phenomenon may explain the satisfactory results obtained in prophylaxis of post-operative thrombosis by ultra-violet irradiation of the operation field. A. S.

Effect of flavones on blood pressure. L. ARMENTANO (*Z. ges. exp. Med.*, 1938, 102, 219—222).—Certain flavones given intravenously lower the blood pressure of dogs and cats: quercitrin > quercetin and citrin > naringenin > hydroxyflavone and rhamnetin. This effect is due to peripheral vasodilatation. Hesperidin, hesperetin, eriodictyol, and homoeriodictyol have no effect on arterial blood pressure. A. S.

Total arterial resistance and sympathetic stimulation. K. WEZLER and A. BÖGER (*Arch. exp. Path. Pharm.*, 1937, 187, 65—99).—Total arterial resistance in man was determined by registration of pulse curves with simultaneous measurement of blood pressure. The resistance was raised 50—100% by asphyxia, or by stimulation by cold. Intravenous injections of 50—100 mg. of adrenaline decreased resistance. The effect of sympatol (60 mg.) was a marked increase in the total resistance. It was decreased to 1/4 or 1/5 during recovery after severe exercise. Formulae are given to calculate changes of the total resistance when partial resistance changes are known, or vice versa. I. S.

Differences in temperature of skin and muscles of the lower extremities following various procedures. M. FRIEDLANDER, S. SILBERT, W. BIERMAN, and N. LASKEY (*Proc. Soc. Exp. Biol. Med.*, 1938, 38, 150—153).—Measurement by thermocouples of the temp. of the skin and underlying muscles of the leg showed that adrenaline caused a fall in skin temp. and a rise in muscle temp. whilst spinal anaesthesia caused the reverse changes. Intra-

venous 5% NaCl caused a rise in temp. in both situations. V. J. W.

Effect of lactic acid on the arterial wall. W. SCHÖMER and A. DERGUM (*Dtsch. Arch. klin. Med.*, 1938, 181, 349—365).—Lactic acid in concn. of 0.05—0.37% was allowed to drip on a clamped or intact carotid artery in rabbits for 5—30 min.; the artery was histologically examined either immediately afterwards or, in survival experiments, many months later. Complete necrosis of the media and thickening of the intima were observed. A. S.

Effect of exercise vasodilator substances on intermittent claudication. F. KISCH (*Wien. Arch. inn. Med.*, 1938, 32, 71—84).—The effect of nitroglycerin, theophylline-ethylenediamine, caffeine, and alcohol on intermittent claudication was studied. The test was the no. of times the recumbent patient was able to bend and extend the leg at the hip maximally before pain set in. The most effective were nitroglycerin and intravenous injections of euphyllin. A. S.

Respiratory bio-hæmodynamics. E. DE SOMER (*J. Physiol. Path. gén.*, 1937, 35, 907—920).—Sinus arrhythmia is attributed to intra-pulmonary vascular changes. C. A. A.

Influence of digitalis, alcohol, and adrenaline on respiratory bio-hæmodynamics. E. DE SOMER (*J. Physiol. Path. gén.*, 1937, 35, 921—940).—The action of these substances on rhythmicity and excitability of the heart is discussed. C. A. A.

An intravenous needle holder. R. COHEN (*J. Pediat.*, 1938, 12, 527—528).—A needle holder to fix the needle for intravenous infusions is described and illustrated. C. J. C. B.

Venous splenomegaly. Experimental portal congestion. T. B. MENON (*J. Path. Bact.*, 1938, 46, 357—365).—Portal obstruction in small animals was induced by narrowing the lumen of the portal vein. The spleen was enlarged threefold and infarcted after complete occlusion of the vein. This enlargement was negligible after 3—6 months' partial obstruction. The spleen showed sinusal dilatation, distension of the pulp and trabecular veins, and atrophy of the pulp, but no hyperplastic reactions. W. L. D.

Chronic and fatal form of hydrothorax produced in rabbits by the intrapericardial injection of tincture of iodine and the mechanism of its production. J. H. DIBLE and G. A. C. LYNCH (*J. Path. Bact.*, 1938, 46, 271—287).—The injection of strong irritants intrapericardially produced a form of bilateral chronic and fatal hydrothorax in rabbits, not due to cardiac embarrassment or gross venous obstruction. Under such conditions, the permeability of the vessels supplying fluid to the serous surface was proved by dye experiments to be increased and the resolving mechanism was obstructed, as particulate matter failed to pass from the pleural sacs to the mediastinal glands. The fluid exudate increased so much in protein content and viscosity that it could not move across the inflammatory zone. It is suggested that this qual. disturbance in tissue fluid is an important factor in producing cedema of inflamed tissues. W. L. D.

Blood-pressure amplitude in circulatory decompensation. K. E. ROTHSCHUH (Dtsch. med. Wschr., 1938, 64, 436—438).—A review. A. S.

Association of adenomyosarcoma of the kidney (Wilm's tumour) with arterial hypertension. E. J. BRADLEY and M. C. PINCOFFS (Ann. int. Med., 1938, 11, 1613—1628).—5 cases of adenomyosarcoma of the kidney in children aged 2 months to 6 years are described. In all there was arterial hypertension which in 2 cases was temporarily relieved by removal of the affected kidney. Subsequent development of metastases raised the pressure again. In 3 cases autopsy showed no other cause for hypertension; in one of these cases an extract of the tumour injected into a dog had no effect on the blood pressure.

C. A. K.

Basal metabolic rate and hypertension. M. GEORGOPOULOS and N. TSAMBOULAS (Dtsch. med. Wschr., 1938, 64, 452—455).—A review. A. S.

Reaction of hypertensive patients to atmospheres containing high concentrations of heavy ions. L. P. HERRINGTON and C. KUH (J. Ind. Hyg., 1938, 20, 179—187).—Five female subjects with systolic blood pressure of 150—240 mm. were treated 3 times weekly during 6 to 24 months by ion-condens. of 1.0×10^6 per c.c. Control periods were inserted when ions were absent. Charged sub-microscopic particles of MgO dust were used. There were no acute results, and no subjective sensations. The blood-pressure changes produced were due to extraneous factors, mainly changes in body-wt., and not to the ions. Metabolic rate was unaffected.

E. M. K.

Pathogenesis of arterial hypertension in coarctation of the aorta. D. A. RYTAND (Proc. Soc. Exp. Biol. Med., 1938, 38, 10—11).—Partial or complete occlusion of the aorta in rats causes cardiac hypertrophy only when there is living renal tissue distal to the occlusion.

V. J. W.

Effect of total thyroidectomy on production and maintenance of experimental hypertension. F. GLENN and E. P. LASHER (Proc. Soc. Exp. Biol. Med., 1938, 38, 158).—Hypertension caused by constriction of the renal arteries is unaffected by thyroidectomy.

V. J. W.

Demonstration of a humoral mechanism in hypertension of renal origin. B. A. HOUSSAY and J. C. FASCILOLO (Bol. Acad. Nac. Med. Buenos Aires, 1937, 342).—A kidney removed from a dog with hypertension produced by partial occlusion of the renal artery was grafted into a chloralosed recently nephrectomised dog; in 5—10 min. the blood pressure of the receptor rose by 32—70 mm. Hg. Removal of the grafted kidney produced a gradual fall in blood pressure. Kidneys from normal dogs with normal blood pressure did not produce hypertension when grafted into normal dogs.

J. T. L.

Observations on the pathological changes following experimental hypertension produced by constriction of the renal artery. C. G. CHILD (J. Exp. Med., 1938, 67, 521—527).—In 6 dogs, acute hypertension followed rapid constriction of the renal arteries. Post-mortem gross kidney damage was

found and extensive capillary hæmorrhages, but nothing abnormal in the arterioles and larger arteries. In 12 dogs with chronic hypertension, no gross renal changes were found but microscopically the kidneys showed degeneration of glomeruli and tubules with interstitial fibrosis. The smaller arteries had thickened walls, possibly accounting for the maintenance of the hypertension.

A. C. F.

Experimental arterial hypertension in rabbits. Effect of section of renal nerves. B. G. MAEGRAITH and F. J. MCLEAN (J. Physiol., 1938, 92, 44—45P).—2—3 c.c. of a 1% suspension of kieselguhr white in 1% gum arabic solution in physiological saline are injected into a renal artery. In some animals blood pressure (carotid loop method) rises (by 12—50 mm. Hg) at once after the injection and stays up permanently; in others the initial rise is succeeded by a fall, followed in a few days by a further rise to a permanent high level. Section of renal nerves reduces the pressure to the original low level. After the injection there is a temporary rise in blood-urea-N; output of urine per day decreases for 3—9 days and then may exceed normal vol.

J. A. C.

Chronic experimental hypertension and renal function. R. FONTAINE and P. MANDEL (Compt. rend. Soc. Biol., 1938, 127, 445—446).—Hypertension was produced in 3 dogs by elimination of the sino-aortic nerves. Renal function was unaffected, even after 2 years.

D. N.

Histology of kidneys in chronic experimental hypertension. G. HOERNER, R. FONTAINE, and P. MANDEL (Compt. rend. Soc. Biol., 1938, 127, 446—448).—The kidneys from the animals prepared as already described (preceding abstract) showed no serious abnormalities.

D. N.

Effects of sub-total bilateral adrenalectomy and splanchnic section on chronic experimental hypertension. R. FONTAINE and P. MANDEL (Compt. rend. Soc. Biol., 1938, 127, 448—450).—Removal of one adrenal does not affect the hypertension. If more than half the other adrenal is removed and the splanchnic nerves are divided, a considerable but transient fall of pressure occurs.

D. N.

Rôle of the thyroid and parathyroid in the development of arteriosclerosis. H. HANDOVSKY (Schweiz. med. Wschr., 1938, 68, 425—428).—A review.

A. S.

Spontaneous cardiovascular disease in the rat.

I. Lesions in the heart. II. Lesions in the vascular system. S. L. WILENS and E. E. SPROUL (Amer. J. Path., 1938, 14, 177—200, 201—216).—487 inbred untreated white rats were observed over their whole life. Myocardial fibrosis and coronary sclerosis and cardiac hypertrophy were most common. Chronic auriculitis (3.7%) and chronic pericarditis (6%) are peculiar to the rat. The changes appeared late in the second year and were max. in the middle of the third year. In the blood vessels intimal lesions and amyloidosis were absent. Only the coronary and pulmonary arteries showed degenerative changes commonly; in 9.7% a condition closely resembling periarteritis nodosa was seen. Renal lesions occurred

but their association with vascular disease was not established. The arterioles were rarely affected.

C. J. C. B.

(d) RESPIRATION AND BLOOD GASES.

Handbuch der Anatomie des Kindes. Vol. I, Part 4. Edited by K. PETER, G. WETZEL, and F. HEIDERICH (J. F. Bergmann, Munich, 1936, pp. 525—628).—This part is devoted to the respiratory apparatus.

H. A. HA.

Function of the bronchial tubes. M. ELLIS (Lancet, 1938, 234, 819—825).—A balloon method of recording changes in the calibre of the bronchi in the dog is described. The bronchial muscle is in a state of const. tone; factors influencing this tone are discussed. Rhythmic changes in calibre associated with respiration are produced passively by thoracic movements. The relation of these findings to asthma is discussed.

C. A. K.

Relation of pulmonary function to fibrosis and emphysema. J. A. MILLER and I. RAPPAPORT (Ann. int. Med., 1938, 11, 1644—1661).—A review.

C. A. K.

Measurement of dead space and pulmonary volume. G. BREBION and H. MAGNE (Ann. Physiol. Physicochim. biol., 1937, 13, 899—900).—Some details are added to a description previously given (*ibid.*, 65).

D. T. B.

Part played by reflexes from the carotid body in the chemical regulation of respiration in the dog. J. H. COMROE, jun., and C. F. SCHMIDT (Amer. J. Physiol., 1938, 121, 1, 75—97).—The chemical receptors of the carotid of the dog are located entirely in the carotid body. Under the conditions of these experiments, anoxæmia is a more powerful stimulus than hypercapnia to the carotid body receptors and hypercapnia is the more powerful stimulus to the respiratory centre. The reflex mechanism is brought into play only by unusual emergencies such as cyanide, sulphide, nicotine, lobeline, anoxæmia, and marked increases in the CO₂ tension of the blood, whilst the normal control of breathing is accomplished by the direct effects of CO₂ on the centre. The carotid body receptors are essentially structures in which an interference with oxidations gives rise to afferent nerve impulses stimulant to the respiratory centre, and they are more resistant than the cells of the centre to depression by narcotics, anoxia, and excessive CO₂ tension.

M. W. G.

Basal metabolism in essential hypertension. H. RASMUSSEN (Acta med. scand., 1937, 93, 594—601).—In 30 patients with systolic blood pressures mainly above 200 mm. Hg an increase in basal metabolic rate of approx. 15% (Du Bois) was found, provided dyspnoea and cardiac incompetence were absent. One patient had Graves' disease, and more than half of the cases showed periodic respiration, at times. This accounted for the variable results.

C. A. A.

Oxygen consumption in artificial pyrexia. E. SCHAEFER-FINGERLE (Dtsch. Arch. klin. Med., 1938, 181, 268—274).—Pyrexia was produced by injection of pyrifur, sufrogel, artigon, and vaccines in normal

subjects. The O₂ consumption was often increased before the rise of temp. occurred.

A. S.

Oxygen consumption during exercise. W. BORGARD (Dtsch. Arch. klin. Med., 1938, 181, 339—345).—Trained subjects use more O₂ during exercise than untrained. The increased O₂ consumption is mainly due to an increase of the respiratory amplitude.

A. S.

Effect of oxygen-lack on central nervous system of mammals. L. ASHER and M. HALLER (Z. Biol., 1938, 98, 544—550).—With 4.2% O₂ content of the air, the respiratory centre (in rabbits) continues to function if simultaneously an adrenaline-sugar solution is continuously infused.

B. K.

Subcutaneous administration of oxygen. T. SIMPSON and M. H. BARKER (Arch. Int. Med., 1938, 61, 198—207).—O₂ given subcutaneously to anoxic dogs in amounts far greater than that advised for adult human beings failed to alter the O₂ content or percentage desaturation of the arterial blood. No absorption of subcutaneous O₂ occurred even when it was urgently needed.

T. H. H.

Effects of prolonged exposures to altitudes of 8000—12,000 feet during trans-Pacific flights. R. A. MCFARLAND and H. T. EDWARDS (J. Aviation Med., 1937, 8, 156—177).—The responses of 17 airmen and 11 passengers were studied during a trans-Pacific flight of 14,000 miles involving 122 hr. in the air at an average altitude of 9500 ft. All maintained a high degree of neurocirculatory efficiency as judged by the Schneider index.

C. P. S.

Recent types of face-tents for oxygen administration. J. ARGYLL CAMPBELL (J. Physiol., 1938, 92, 31p).

J. A. C.

Effects of oxygen pressure as influenced by external temperature, hormones, and drugs. J. ARGYLL CAMPBELL (J. Physiol., 1938, 92, 29—31p).—Hypophysectomy (white rats) protects to some extent against O₂ poisoning but is not so efficient as thyroidectomy. The latter has no effect on powers to tolerate acute O₂ want; acute O₂ want is enhanced by subcutaneous injections (white rats, 100 g.) of thyroxine (0.4 mg.) or of dinitrophenol (1.5 mg.). Breathing CO₂ (3—5%) has a partly protective effect in short experiments with acute O₂ want but does not increase the powers to tolerate chronic O₂ want. Rabbits are still unable to become acclimatised to 10% or less of O₂ in the inspired air.

J. A. C.

Spectrophotometer investigation into differences between foetal and maternal hæmoglobin in man. J. JONGBLOED (J. Physiol., 1938, 92, 229—231).—Although the O₂ affinities of foetal and maternal hæmoglobin in man are different from one another, there are no demonstrable differences in their absorption curves in the ultra-violet.

J. A. C.

Some conditions of foetal respiration in cow. J. ROOS and C. ROMIJN (J. Physiol., 1938, 92, 249—267).—As for man but not for other animals, the foetal has a higher O₂ capacity than the maternal blood. During the first hr. after parturition the O₂ capacity of the maternal and foetal bloods rises, the former to the greater extent. Some weeks before

term the foetal arterial blood is about 90% saturated and the venous about 45%. The O_2 dissociation curve of the foetus lies to the left of that for the mother (pregnant and non-pregnant); it also differs from the maternal curve in shape and position. For 50% saturation the foetal blood requires an O_2 pressure of only 11.5 mm. Hg while the maternal blood requires 34.5 mm. The shape and position of the CO_2 dissociation curve of the foetus indicate a difference between the properties of foetal and maternal hæmoglobin. There exists a difference of partial pressure on either side of the placenta of 64 mm. for O_2 and 9 mm. for CO_2 . J. A. C.

Affinity of hæmoglobin for oxygen in marine fishes. F. G. HALL and F. H. McCUTCHEON (J. Cell. Comp. Physiol., 1938, 11, 205—212).—Various fish bloods were hæmolyzed and the O_2 affinity of the hæmoglobin was measured by determining the O_2 pressure necessary to half-saturate the solution. Active fish the blood of which had a high O_2 capacity had a hæmoglobin of low O_2 affinity; in less active fish the converse is the case. V. J. W.

Displacements of the oxygen dissociation curve of hæmoglobin at constant hydrogen-ion concentration. L. TRAVIA, H. H. HERMANN, and H. NETTER (Naturwiss., 1938, 26, 138—139).—Between p_H 7.3 and 7.8, the O_2 dissociation curve of the blood depends on the p_H and on the abs. amount of CO_2 available, being displaced to the left at low $[CO_2]$. This effect is probably due to alterations in the amount of CO_2 combined with hæmoglobin as carbamic acid groups and explains the displacement to the left of the O_2 dissociation curve at high altitudes. W. O. K.

Salt effect on the hæmoglobin-oxygen equilibrium. A. E. SIDWELL, jun., R. H. MUNCH, E. S. G. BARRON, and T. R. HOGNESS (J. Biol. Chem., 1938, 123, 335—350).—At approx. const. p_H (6.8—7.15), the amount of combination of aq. dialysed hæmoglobin with O_2 at a definite pressure is decreased by the presence of $NaCl$, KCl , Na_2SO_4 , Na citrate, $NaH_2PO_4 + Na_2HPO_4$, or $NaHCO_3 + CO_2$, the effect increasing in the order given. The action is probably not in general explicable as an ionic strength effect, but is due in some cases at least to combination of the anion with hæmoglobin. The spectra of hæmoglobin and oxyhæmoglobin from the ultra-violet region to 770 $m\mu$. are described. W. O. K.

Blood-oxygen in experimental acidosis and alkalosis. P. VALDIGUÉ and J. FERRIEU (Compt. rend. Soc. Biol., 1938, 127, 577—579).—Alkalosis in dogs is accompanied by a decrease in the blood- O_2 (more marked in venous than in arterial blood) whilst an increase in the arterial, and a decrease in the venous, levels occur in acidosis. H. G. R.

Critical dissociation pressure of dissolved and undissolved oxyhæmoglobin. R. SPITZER (Klin. Woch., 1937, 16, 1323—1324).—The crit. dissociation pressure for oxyhæmoglobin in unhæmolyzed cells is 60 mm. Hg; with hæmolyzed cells it is 30 mm. F. W. L.

Respiratory pigment of the sea lamprey *Petromyzon marinus*, L.) and the zoological

distribution of the protohæmatinic (hæmoglobins and erythrocrucorins) respiratory pigments. J. ROCHE and M. FONTAINE (Compt. rend., 1938, 206, 626—628).—Measurements of the osmotic pressure of solutions (0.179—1.150%) of the respiratory pigment of *P. marinus* at p_H 7.38 and 0° indicate that the mol. wt. is 16,700 (some determinations indicate an aggregation of the mols.). The isoelectric point is p_H 5.7 in the range for invertebrate erythrocrucorins. The arginine and lysine contents resemble those of hæmoglobins, whilst the histidine and cystine contents resemble those of erythrocrucorins. It is suggested that the fishes and the *Cyclostomes* should be regarded as distinct morphological groups. J. L. D.

Modified manometric blood gas apparatus. P. F. SCHOLANDER (Skand. Arch. Physiol., 1938, 78, 145—148).—A modification of the original Van Slyke apparatus is described. A. S.

Determination of very small amounts of carbon monoxide-hæmoglobin in the blood. J. MAY (Arch. Gewerbepath. Gewerbehyg., 1937, 8, 21—25).—2% CO-hæmoglobin and differences of 0.5% CO-hæmoglobin may be determined in 0.1-c.c. samples of blood by the use of the Pulfrich photometer with a Hg-vapour lamp. M. A. B.

Carbon monoxide-pseudohæmoglobin and action of carbon monoxide on the organism. G. BARKAN (Dtsch. med. Wschr., 1938, 64, 638—640).—Pseudohæmoglobin (E) (hæmoglobin with an oxidised porphyrin ring) is intermediate between hæmoglobin and bile pigments. Pseudohæmoglobins may contain Fe^{II} or Fe^{III} . Arterial blood contains EO_2 . The affinity of E for CO is greater than that of hæmoglobin. The affinity of E for CO is 800 to 2000 times as great as for O_2 . A. S.

Respiratory inhibition by carbon dioxide stimulation in the lungs of young ducks. W. F. WINDLE and D. NELSON (J. Cell. Comp. Physiol., 1938, 11, 325—331).—3—10% of CO_2 added to the air respired by young ducklings causes slowing and inhibition of respiration; after section of the vagi CO_2 causes deep and rhythmic breathing. O_2 lack always causes acceleration. V. J. W.

Catalytic effect of buffers on reaction $CO_2 + H_2O \rightleftharpoons H_2CO_3$. V. H. BOOTH and F. J. W. ROUGHTON (J. Physiol., 1938, 92, 36—38p).—These catalytic effects should be borne in mind in work with buffers containing CO_2 or HCO_3^- at physiological p_H vals., e.g., in investigating the p_H -activity curve of carbonic anhydrase. J. A. C.

(e) MUSCLE.

Histogenesis of muscle in the regenerating fore limb of larval *Amblystoma punctatum*. C. S. THORNTON (J. Morph., 1938, 62, 17—48).—In a series of larvæ the forelimb was amputated through the proximal third of the humerus. Within 4 hr. the stump was healed by a covering of a single layer of epidermal cells. In the next 2 days the tissues beneath the new epiderm degenerated, to be followed by conversion of muscle fibres into undifferentiated cells. At the 5th day the regeneration blastema con-

sisted of de-differentiated cells formed from muscle, cartilage of the humerus, connective tissue of the nerve sheath and perichondrium. At the 7th day the muscle of the regenerated limb was formed partly from sarcoplasmic buds near the injured muscle fibres and partly from the blastema.

H. A. HA.

Histogenesis of the regenerating fore limb of larval *Amblystoma* after exarticulation of the humerus. C. S. THORNTON (J. Morph., 1938, 62, 219—242).—The regeneration of the limb of the larvæ after complete removal of the humerus with disarticulation at the shoulder joint proceeds at the same rate as regeneration after amputation. The blastema which gives rise to all the tissues of the new limb is formed from the muscle, connective tissue of the muscles and of the brachial plexus. The head of the humerus is often incompletely regenerated because of the limitation of the blastema by the glenoid cavity of the scapula.

H. A. HA.

Double refraction of single intact striped muscle fibres. I. F. BUCHTHAL and G. G. KNAPPEIS (Skand. Arch. Physiol., 1938, 78, 97—116).—The double refraction (d.r.) of single intact skeletal muscle fibres of frogs or lizards is $(1.7 \pm 0.016) \times 10^{-3}$; after 10—45% stretching of the fibre it is 1.75×10^{-3} . The d.r. of a fatigued muscle fibre decreases by 26%; its lactic acid content is increased by 315%. The d.r. is not decreased in fatigued muscle fibres poisoned with iodoacetic acid. If the same concn. of lactic acid, which would develop during fatigue, is applied to the resting fibre, the d.r. is lowered by 35%; lactic acid inside the muscle fibre is increased only by 180%. Lactic acid-Ringer and acetic acid-Ringer solutions diminish increasingly the d. r. with increased concns. Anions do not exert a sp. influence on the d.r. There is no exchange between cations inside and outside the fibre (e.g., H^+ outside and K^+ inside). H_3PO_4 (p_H 3.8) and NH_4 phosphate (p_H 4.4) in high concns. do not influence the d.r.

A. S.

Reversal of neuro-muscular block by catelectrotonus. B. KATZ (J. Physiol., 1938, 92, 20—21p).—When a weak neuro-muscular block is produced (by curarine, strychnine, Mg, large excess of Ca, fatigue), transmission across many myoneural junctions can be restored (1) by sending in two nerve volleys following one another at a short interval (Adrian and Lucas; Bremer), (2) by applying in addition to a single nerve volley a subthreshold const. current to the muscle with the cathode near the myoneural region (nerve-sartorius prep., *Rana esculenta*).

J. A. C.

Effect of small doses of curarine on neuro-muscular conduction. G. L. BROWN (J. Physiol., 1938, 92, 23—24p).—Two max. motor nerve volleys are set up at varying time intervals in a decerebrate cat, which has received a dose of curarine insufficient completely to block neuro-muscular conduction. There is a long lasting depression—concerned with slow replacement of acetylcholine—following a first response which, in its earlier phases, is more than counterbalanced by a facilitation due to a different process.

J. A. C.

Neuro-muscular conduction in the fowl. G. L. BROWN and A. M. HARVEY (J. Physiol., 1938, 92, 24—25p).—Optical isometric myograms and action potential records were taken from the lateral head of the gastrocnemius (fowl; pernocton anaesthesia; temp. subnormal); slightly supramax. break shocks were applied to the nerve twig supplying the muscle. Increase of initial tension increases strikingly the twitch tension; action potentials show random variations of less than 5%. When two volleys are set up in the nerve less than 200 m.-sec. apart, the action potential in response to the second (more fibres excited and facilitation) is greater than the first; as the volleys are separated the second progressively diminishes in size until the two are equal.

J. A. C.

Comparative study of the double motor innervation in marine crustaceans. C. A. G. WIERSMA and A. VAN HARREVELD (J. exp. Biol., 1938, 15, 18—31).—The double motor innervation of the adductors of the claws of *Randallia* and *Blepharipoda* and of the adductor of the dactylopodite of the walking leg of *Cancer* was studied. The ratio of the diameters of the two motor axons which innervate these muscles is 1.4:1. Stimulation of the thick fibre causes a "fast" contraction. The action currents of the two kinds of contraction differ. Both show facilitation, but under the same conditions of stimulation the "fast" action currents are greater. The first stimulus to the thick fibre causes an action current, but in the case of the thin fibre only after a no. of stimuli. A single impulse in the thick fibre does not cause a contraction but sets up a muscle action current. Two impulses in the thick fibre may cause a mechanical response.

J. M. R.

"Neuro-muscular contracture" in *Rana temporaria* and mechanism of neuro-muscular transmission. F. BREMER and J. MOLDAVER (Compt. rend. Soc. Biol., 1938, 127, 352—355).—"Neuro-muscular contracture" of frog's gastrocnemius (cf. J. Physiol., 1932, 76, 65) is further analysed. This consists of a slow secondary contraction during the relaxation phase following two or more stimuli applied to the motor nerve at suitable intervals. Evidence is presented that this "contracture" is not mediated by acetylcholine. This is regarded as supporting the electrical theory of neuro-muscular transmission.

D. N.

Depolarisation of muscle and nerve membranes by organic substances. R. HÖBER (Compt. rend. Trav. Lab. Carlsberg, 1938, 22, 205—210).—Resting potentials of sartorius muscle and sciatic nerve of the frog, and spider crab nerves were determined after injury by org. chemicals. With frog muscle the higher dialkylamines, some alkaloids, and anions of higher fatty acids, bile acids, and salicylic acid are all depolarisers. With the sciatic nerve, only the cations of the higher dialkylamines and anaesthetics are active. Spider crab nerves have a much greater tendency to become polarised than frog nerves.

J. N. A.

Preparation of tibialis anterior (cat) for close arterial injections. G. L. BROWN (J. Physiol., 1938, 92, 22—23p).—This muscle offers advantages

over gastrocnemius for electrical recording, since prep. is easy and rapid, tensions are more convenient for record, the composition of pale fibres is uniform and the tendon is long. J. A. C.

Effect of adaptation to electrical and chemical stimulation on excitability of anterior retractor of byssus of *Mytilus edulis*. I. SINGH (J. Physiol., 1938, 92, 241—248).—This unstriated muscle relaxes, after preliminary contraction, during continued electrical stimulation (a.c.) or chemical stimulation, i.e., it becomes in some way adapted to the stimulus. NaCl, NaCN, BaCl₂, and rise of temp. decrease adaptation to the stimulus; adaptation to the first three is slow. Ca (0.01—0.02M-CaCl₂), Mg (0.04M), and K (0.01—0.02M) increase adaptation. Adaptation to K is decreased by NaCl, NaBr, NaNO₃, and Ca⁺⁺ (0.01—0.02M), and increased by rise of temp. (15—35°) and decrease of p_H . J. A. C.

Isotonic extension and shortening of anterior retractor of byssus of *Mytilus edulis*. I. SINGH (J. Physiol., 1938, 92, 232—240).—Isotonic extension curves of *Mytilus* plain muscle resemble those of frog sartorius stretched while in contracture. Substances that make the muscle contract decrease the rate of extension and increase the rate of shortening. Certain substances increase or decrease the rate of extension as well as that of shortening; stretch curves of this plain muscle resemble those of human hair. J. A. C.

Rapid galvanometer system for myothermic experiments. A. V. HILL (J. Physiol., 1938, 92, 43—44P). J. A. C.

Influence of photodynamic sensitisation on the electrical and chemical stimulation of muscle and cutaneous nerve endings in the frog. A. J. KOSMAN (J. Cell. Comp. Physiol., 1938, 11, 279—289).—When the frog's sartorius is stained with 0.1% eosin in Ringer's solution for 30 min. and exposed to light it gives a greater response to condenser discharges at 60 per min. but not to single shocks. Before exposure to light its sensitivity is lessened by the eosin staining. Sensitivity to chemical stimulation of KCl or NaNO₃ was also increased by staining and illumination. V. J. W.

Magnesium narcosis in muscle. E. W. ASHKENAZ (J. Cell. Comp. Physiol., 1938, 11, 163—174).—Single fibres of frog muscle were stimulated by condenser discharges and threshold voltages determined. The fibres were immersed in Ringer's solution, and the addition to this of twice its vol. of isotonic MgCl₂ caused a 2—10-fold increase in the threshold voltages. Excitability could be restored temporarily by the addition of CaCl₂ and permanently by replacement by fresh Ringer's solution. V. J. W.

Initial heat and thermo-elastic effect in muscle. H. REICHEL (Z. Biol., 1938, 98, 510—526).—Temp. changes in muscle during isometric contraction and passive stretch were measured (thermionic micro-voltmeter of Wöhlisch and Clamann). The isometric initial heat is regarded as a "thermo-elastic effect" due to internal stretching of elastic components of

the muscle; a const. ratio between heat production and tension rise is found in resting and active muscle. B. K.

Buffering of muscle in rigor; protein, phosphate, and carnosine. E. C. B. SMITH (J. Physiol., 1938, 92, 336—343).—60—75% of the buffering of mammalian skeletal muscle in rigor between p_H 7.5 and 5.5 is due to non-protein substances. "PO₄" accounts for about $\frac{1}{2}$ of this non-protein buffering. The remainder is largely due to carnosine and anserine, which buffer strongly in this range with a max. of buffering at about p_H 7. J. A. C.

Changes in ease of extraction of myosotin-type proteins as a result of activity. J. F. DANIELLI (J. Physiol., 1938, 92, 36P).—For resting frog muscle $R = 0.5—0.8$ ($R = \text{insol. protein} : \text{sol. protein}$); in iodoacetate rigor R varies from 1.4 to 3.0. For resting leg muscle of *Carcinus* $R = 0.25$, 0.5 for iodoacetate rigor, and 0.25—0.5 for stimulation (5 per sec.) of nerve. $R = 1.2$ before and after stimulation to exhaustion (5 shocks per sec.) of "non-medullated" leg nerve of *Maia*. J. A. C.

Influence of training on the indophenol-blue oxidase content of voluntary muscle. M. GUKELBERGER and E. KEISER (Arbeitsphysiol., 1938, 10, 94—102).—Hypertrophy of the muscles of the right back leg was induced in rabbits by repeated faradic stimulation. The oxidase content of these muscles estimated by the indophenol-blue synthesis was raised. Excessive stimulation led to a fall. The increased O₂ usage of trained muscles is attributed to this rise in the rate of cellular oxidations. E. J. W.

Quantitative measurement of methylene-blue reduction by frog muscle. J. JONGBLOED (Z. Biol., 1938, 98, 497—509).—A modification of Thunberg's methylene-blue method for measuring tissue respiration is described. The progressive reduction of methylene-blue to its leuco-base by minced frog's muscle is followed at intervals by photo-electric recording. The influence of different concns. of methylene-blue was studied. To avoid prolonged "absorption" of the dye by the tissue, low concns. (less than 5×10^{-5}) should be used. The rate of dye reduction ("reduction factor per min.") is used as a characteristic measure. B. K.

Glycolysis. II. First stages of glycolysis in muscle extracts. L. P. KENDAL and L. H. STICKLAND (Biochem. J., 1938, 32, 572—584; cf. A., 1938, III, 20).—A quant. study has been made of the mechanism of the conversion of carbohydrate into lactic acid by muscle extracts, via glucose 1-monophosphate and hexose 6-monophosphate. In the first step, Mg⁺⁺ and nucleotides are essential co-enzymes, the reaction rate being approx. linear for only about 10 min. The reaction rate is identical at 37° and 20° but only very slow at 0°, whilst the conversion of the 1-monophosphate into the 6-monophosphate (which requires Mg⁺⁺ and hexose diphosphate as co-enzymes) occurs more rapidly at 37° than at 20°. The latter ester is more difficult to hydrolyse by N-HCl at 100° (30% in 4 hr.) than the former (almost complete in 10 min.). 0.01M-Phloridzin inhibits initial phosphorylation. P. G. M.

Glycogen and muscular fatigue. A. MOSCHINI and P. P. DE NAYER (Compt. rend. Soc. Biol., 1938, 127, 836—838).—Increasing the quantity of glycogen in the muscles did not increase its capacity for work in aerobic and anaerobic media, although a considerable quantity of glycogen remained unchanged. H. G. R.

Oscillographic study of electron transfer by yellow enzyme and by cytochrome c during muscular contraction. F. URBAN and H. B. PEUGNET (Proc. Roy. Soc., 1938, B, 125, 93—103).—The apparatus used to record instantaneous changes in the absorption spectrum of muscle is described. By means of it, yellow enzyme and cytochrome c are shown to be active during the aerobic contraction phase of a gastrocnemius muscle. F. B. P.

Action of curare on the anaerobic metabolism of muscle. R. LIPPMANN and J. WAIZER (Compt. rend. Soc. Biol., 1938, 127, 508—510).—Nachmansohn's results are confirmed that curare does not modify the phosphagen breakdown in resting anaerobic muscle; after stimulation, phosphagen concn. is higher in curarised muscle. The concn. of lactic acid is less in resting curarised muscle than in normal muscle. D. N.

Inhibition of lactic acid formation by oxygen. A. HAHN and H. NIEMER (Z. Biol., 1938, 98, 527—532).—Lactic acid formation in minced muscle cannot after a certain time be inhibited by O_2 . The inhibitory effect of O_2 is restored, without accompanying increase of O_2 consumption, by the addition of a certain substance, previously extracted from muscle tissue. The inhibitory effect of O_2 on lactic acid production is not due merely to oxidation of lactic acid. B. K.

Metabolism of creatine and creatinine in muscle disease. A. T. MILHORAT and H. G. WOLFF (Ann. int. Med., 1936, 9, 834—837).—Metabolic disturbance is directly correlated with the total mass of improperly functioning muscle. Creatinuria and a lowered creatine tolerance are usually observed. CH. ABS. (p)

Myasthenia gravis. M. ADAMS, M. H. POWER, and W. M. BOOTHBY (Ann. int. Med., 1936, 9, 823—833).—In myasthenia gravis blood-Ca, -Mg, -Na, -K, -P, -glucose, -urea, -creatinine, -aminoacids, and -uric acid were normal. Administration of glycine did not affect creatinine excretion. CH. ABS. (p)

Effect of quinine on myotonia congenita. G. HOLLAND and W. FELD (Dtsch. med. Wschr., 1938, 64, 566).—Satisfactory results were obtained with quinine treatment. A. S.

Primary disease of voluntary muscles. S. NEVIN (J. Neurol. Psychiat., 1938, 1, 120—141).—Crit. review. J. D.

(f) NERVOUS SYSTEM.

"Senile pigmentation" of nerve cells. R. ALTSCHUL (Virchow's Arch., 1938, 301, 273—286).—Evidence is presented that the lipofuscin in nerve cells is not a sign of senile degeneration. The pigment is found only in cells of certain parts of the central

nervous system. It appears in different cells at different times of life. The lipoid constituent of the lipofuscin decreases with increasing age while the pigment itself becomes more abundant. It is assumed that lipofuscin is a normal constituent of certain cells (not only nerve cells), and plays an important rôle in their metabolism. H. W. K.

Neurone as studied by micro-incineration. L. ALEXANDER (Brain, 1938, 61, 52—62).—The nucleolus and Nissl bodies of ganglion cells contain rich deposits of heat-resistant minerals; the nucleus contains a small amount, the remainder of the cytoplasm (including the axis cylinder) none. The mineral ash residue is greater during ontogenetic development than after differentiation, suggesting a correlation with growth and metabolic activity. Marked differences in mineral ash residue exist between ganglion cells of different regions, although ordinary staining methods disclose no dissimilarity. Thus the granular cells of the cerebellar cortex are much richer than those of the cortical architectural fields. J. D.

Tissue agents in nerve excitation. H. STAUB (Klin. Woch., 1937, 16, 1137—1143).—Review. F. W. L.

Transmission of excitation between excised non-myelinated nerves. An artificial synapse. H. H. JASPER and A. M. MONNIER (J. Cell. Comp. Physiol., 1938, 11, 259—277).—Two bundles of non-medullated crustacean nerve fibres were placed in contact for about 1 cm. at one end while the other ends were connected with oscillographs. One such end was stimulated either electrically or chemically, and the electric changes so caused were able to produce synchronous electric changes in the other nerve which was in contact with the stimulated one. There was a delay of about 0.02 sec. in the passage of the excitation across the region of contact. V. J. W.

Capacitative theory of local excitatory process in nerve. O. H. SCHMITT (J. Physiol., 1938, 92, 38—39p).—A considerable simplification of nerve excitation theory is effected on the assumption that the local excitatory process consists primarily in a change of membrane capacitance rather than in a resistance breakdown. J. A. C.

Later after-potentials in nerve. O. H. SCHMITT (J. Physiol., 1938, 92, 39p).—If special precautions are taken to ensure a steady base line, certain phases of the nerve after-potentials may persist for more than 1 hr. J. A. C.

Spread of local action potential in single nerve fibre of crab. J. M. LEDINGHAM and D. SCOTT, jun. (J. Physiol., 1938, 92, 41—43p).—Hodgkin's results are confirmed and extended. The height of the local effect is proportional to the stimulus strength from zero to about 60% of threshold, but from here it increases more and more rapidly until at threshold it is rising almost vertically. A fourth electrode is added and the distance between stimulating and recording leads is increased from zero to 10 mm.; both electrotonus and local action potential decrease to zero in a roughly exponential manner. J. A. C.

Apparatus for studying asphyxiation of nerve at different temperatures. H. SHAPIRO (J. Physiol., 1938, 92, 43p). J. A. C.

Effect of sodium thiocyanate on the threshold curve of nerve. A. CHWEITZER (Compt. rend. Soc. Biol., 1938, 127, 497—500).—Frog's nerve was soaked for 2 hr. in a sol. consisting of equal vols. of saline and isotonic NaSCN. The anelectrotonic part of the curve was affected, but the catelectrotonic part was unchanged. D. N.

Electrophysiological studies on strychnine paralysis of frogs. F. BUCHTHAL and H. LÖWENBACH (Skand. Arch. Physiol., 1938, 78, 83—96).—Sciatic-gastrocnemius preps. of *Rana temporaria* and of *R. esculenta* were bathed in Ringer solutions containing different concns. of strychnine. The same strychnine concns. cause an irreversible neuromuscular block to electrical stimulation of the sciatic much earlier in *esculenta* than in *temporaria* preps. The spontaneous action potentials of the spinal cord of frogs, recorded by a d.-c. amplifier and cathode-ray oscillograph, are diminished and finally abolished by strychnine; this occurs more quickly in *R. temporaria* than in *esculenta*. Electrical stimulation of the optical lobe does not produce potentials of the spinal cord during the strychnine paralysis of the cord. A. S.

Sensory fibres in spinal accessory nerve. F. ECHLIN and N. PROPPER (J. Physiol., 1938, 92, 160—166).—Records of action potentials (single fibre preps.) indicate that the sensory fibres come from stretch receptors in the muscles supplied by this nerve (cat). These receptors give high-frequency discharges when the muscles are stretched rapidly but it does not appear that such discharges can give rise to pain. The results confirm Windle's suggestion that proprioceptive fibres are present in this nerve. J. A. C.

Variations in reflex excitability of the spinal cord in batrachians. P. CHAUCHARD (Compt. rend. Soc. Biol., 1938, 127, 284—287).—In selacians the isolated spinal cord is quiescent, except in response to stimulation. D. N.

Interpretation of potential changes in spinal cord. D. H. BARRON and B. H. C. MATTHEWS (J. Physiol., 1938, 92, 276—321).—Slow potential changes which occur in the dorsal and ventral roots have been studied further in frogs and cats (cf. Physiol. Abs., 1936, 21, 266, 462). The proximal electrode is always negative to the distal. Spatial summation, occlusion, and temporal summation are exhibited in the case of dorsal root. Similar changes in the ventral roots precede any discharge of impulses and the frequency of the impulse discharge is related to the level and rise of the potential; unlike the changes of the dorsal root, the potentials of the ventral root may be reduced by stimuli which inhibit impulse discharge. Antidromic volleys via the ventral roots produce only a very small potential change in the ventral roots. The motor neurone is regarded as being like a sense organ, responding to the level of central excitatory state in its immediate surroundings and depolarised by afferent impulses as in a sense

organ by its appropriate stimulus. In the dorsal roots the slow potentials have an origin similar to that of the negative after-potential in peripheral nerve fibres. Many central processes may be interpreted on the basis of the membrane theory of nervous action. J. A. C.

Atropine treatment of striatal disease associated with jaundice. A. VAN WESTRIENEN and C. DE LANGE (Jb. Kinderheilk., 1937, 150, 257—266).—Hypertrophy of the muscles and extrapyramidal motor disturbances resulting from hepatogenous icterus in an infant were influenced favourably by atropine. The histological examination of the case shows a diminution and destruction of nerve cells in the corpus striatum and subthalamicum. H. R.

Action of narcotics on brain respiration. M. JOWETT (J. Physiol., 1938, 92, 322—335).—The effects on respiration of slices of cerebral cortex (mainly rat) were investigated in the presence of glucose. The behaviour of various narcotics places them into two classes. In the 1st class (urethane, Mg⁺⁺, chloral, luminal, evipan, chloretone, avertin) and when the inhibitions do not exceed 40%, the inhibitions of respiration caused by narcotics vary little with time; the narcotic reaches a mass-action equilibrium with some component of the respiratory system and the inhibition is given by a simple mass-action equation; with higher concns. (except Mg⁺⁺), the large inhibitions observed increase with time and probably become irreversible; inhibition of glucose oxidation may be the cause of the narcosis. The 2nd class (alcohol, ether) inhibit respiration progressively and probably irreversibly; the anaesthetic concns. are only threshold vals. for the inhibition of respiration. J. A. C.

Rôle of anoxia in production of epileptiform seizures. T. SIMPSON and M. H. BARKER (Arch. Int. Med., 1938, 61, 208—222).—13 epileptic patients were subjected to prolonged anoxia; 5 epileptic-like phenomena were obtained, only one of which was a definite seizure. The acid-base balance of these patients during anoxia was the same as that observed for dogs and normal human beings. The acid-base balance of the epileptic between seizures was normal. T. H. H.

Insulin-shock treatment of schizophrenia. F. G. HALPERN (Chinese Med. J., 1937, 52, 541—548).—Of 8 cases of schizophrenia treated by insulin-shock 4 were cured and 2 improved. P. C. W.

Treatment of schizophrenia with metrazol by the production of convulsions. I. FINKELMAN, D. L. STEINBERG, and E. LIEBERT (J. Amer. Med. Assoc., 1938, 110, 706—709).—66 patients with dementia præcox were treated by metrazol convulsions. This form of therapy appeared of definite val. and the type of convulsive seizure has been recorded in detail. R. L. N.

Routine examination of brain tumours. N. C. FOOT (Amer. J. Path., 1938, 14, 245—252).—Fixation and staining methods used as a routine in the author's laboratory are described (4 photomicrographs).

C. J. C. B.

Mental symptoms associated with brain tumour. M. KESCHNER, M. B. BENDER, and I. STRAUSS (J. Amer. Med. Assoc., 1938, 110, 714—718).—In 530 patients with verified brain tumour no mental symptoms sp. for brain tumour were found. Mental symptoms and disturbances in memory were more frequent with supratentorial than with infratentorial tumours. Complex visual and auditory hallucinations were more frequent with tumours of the temporal lobe. Psychogenic reactions were determined more frequently by physical or by subjective disabilities and by the total personality of the individual rather than by the location of the tumour in any one part of the brain. The pathogenic factors in the production of mental symptoms, in the order of their importance, were: involvement of both sides of the brain; increased rate of development of symptoms of tumour of the brain in general; the rapidity of the tumour growth; sudden appearance and rapid development of intracranial hypertension and supratentorial location of the tumour.

R. L. N.

Results of experimental destruction of chick embryo brain. E. WOLF (Compt. rend. Soc. Biol., 1938, 127, 440—442).—When the whole brain was destroyed by X-rays, the mortality was high, but some embryos survived to the 15th day, and certain parts of the body developed normally. After irradiation of the hind brain alone, 3 embryos, which survived to the 14th—19th day, showed normal development of the body and of the rest of the brain.

D. N.

Effect of complete deafferentation of a part of the cerebral cortex on its spontaneous electrical activity. F. BREMER (Compt. rend. Soc. Biol., 1938, 127, 355—359).—After section of the afferent sub-cortical fibres, the electrical activity of the visual centres of the cat is considerably decreased, but not abolished. The amplitude of the persisting waves is enhanced by local application of strychnine.

D. N.

Electrical studies of brain. I. Periodicity and automaticity of cerebral cortex. Z. DROHOCKI (Klin. Woch., 1937, 16, 1324).—Records were obtained in conscious subjects and in light and deep narcosis.

F. W. L.

Increased spontaneous activity produced in monkeys by brain lesions. C. P. RICHTER (Brain, 1938, 61, 1—16).—A daily record of the spontaneous activity of 19 monkeys was secured by attaching them to cyclometers. Unilateral removal of the prefrontal cortex produced a slight increase in activity, whilst bilateral removal caused a great increase, which reached a steady level in about 30 days. Area 9 was particularly implicated in the control of spontaneous activity. Unilateral removal of the tip of the caudate and putamen produced an immediate increase in activity which was also persistent.

J. D.

Effect of body temperature on reaction time. N. KLEITMAN, S. TITELBAUM, and P. FEIVISON (Amer. J. Physiol., 1938, 121, 495—501).—The performances studied were sensory-motor (reaction to light and sound), and sensory-mental-motor

(choice reactions to light and sound). A diurnal variation in both types of reaction time occurred, dependent on the diurnal body temp. A spontaneous or induced change in body temp. is accompanied by a change in the opposite direction in reaction time. The simpler tasks have relatively low temp. coeffs.; the more complex tasks are characterised by higher coeffs.

M. W. G.

Effects of certain drugs and hormones on conditioning. E. A. WENTINK (J. exp. Psychol., 1938, 22, 150—163).—4 albino male rats were conditioned in the Skinner conditioning box, hunger being the drive. NaBr and ephedrine had no effect; adrenaline and phenobarbital decreased the rate of response by 30% and 100% respectively; insulin increased the rate by 26% and benzedrine by 142%. The doses of the drugs used produced no other observable physiological effects.

A. G. M. W.

Effect of ablation of sensory cortex on the threshold to pain reaction. B. URY and E. OLDBERG (Proc. Soc. Exp. Biol. Med., 1938, 38, 134—137).—Destruction of the sensory cortex related to one hind limb in the cat does not raise the threshold of painful stimulation to that limb as compared with the opposite side. The threshold is determined by noting the strength of faradisation necessary to cause a reflex dilatation of the pupil.

V. J. W.

Observations on pathways transmitting the sensation of taste. H. G. SCHWARTZ and G. WEDDELL (Brain, 1938, 61, 99—115).—4 cases of section of the 5th sensory root showed no taste loss. 6 cases of sensory root section plus injury to facial nerve showed loss of taste on the homolateral anterior $\frac{2}{3}$ of the tongue. 2 of these definitely, and possibly all, had injury to the greater superficial petrosal nerve. 1 case of section of the sensory root and of the greater superficial petrosal nerve with no evidence of injury to the 7th nerve showed loss of taste. 3 cases of excision of the chorda showed loss of taste, while in 2 it was preserved. It is concluded that the pathway for taste from the anterior $\frac{2}{3}$ of the tongue varies. In some the fibres travel in the chorda tympani through the 7th nerve to the geniculate ganglion, while in others the fibres leave the chorda tympani and reach the geniculate ganglion via the otic ganglion and the greater superficial petrosal nerve.

J. D.

Anomalous pyramidal decussation in the Chinese. T. W. CHANG (Chinese Med. J., 1938, 53, 53—56).—Of 46 medullas examined 2 of the 30 adults and 5 of the 16 newborns had asymmetrical pyramidal decussation. They are classified into 4 types.

P. C. W.

Location of the cardinal anatomical orientation planes passing through the centre of weight in young adult women. F. A. HELLEBRANDT, R. H. TEPPER, G. L. BRAUN, and M. C. ELLIOT (Amer. J. Physiol., 1938, 121, 465—470).—The mean percentage height below horizontal plane passing through the centre of gravity is 55, and the average location of the line of gravity is 5.08 cm. in front of the ankle joint. The upright stance is asymmetrical

in the majority of young adult women, the wt. falling preponderantly to the left in a natural stance and to the right when a "best posture" is assumed.

M. W. G.

Standing as a geotropic reflex. F. A. HELLEBRANDT (Amer. J. Physiol., 1938, 121, 471—474).—Standing is movement on a stationary base, sway being inseparable from the upright stance. The incessant shifting of the centre of wt. during stance constantly stimulates new stretch afferents, and may account for the asynchronous rotation of motor units which characterises postural contraction.

M. W. G.

Distribution of material following intracerebral inoculation into *Macacus rhesus* monkeys and its possible influence upon the results of neutralisation tests in experimental poliomyelitis. M. SCHAEFFER and R. S. MUCKENFUSS (Amer. J. Path., 1938, 14, 227—236; cf. A., 1938, III, 105).—India ink injected into the frontal lobe of monkeys was deposited on the surface of the brain and cord and not in the brain substance except at the site of inoculation. The larger was the amount inoculated, or the longer the needle used, the more readily it entered the cerebrospinal fluid. When apparently neutral mixtures of poliomyelitis virus and immune serum were inoculated intracerebrally with $\frac{1}{4}$ -in. and $\frac{3}{4}$ -in. needles, none of the ten monkeys injected with the shorter needles developed poliomyelitis while 4 of the 10 injected with the longer needles died. Nevertheless direct inoculation of these serum-virus mixtures into the subarachnoid space or cisterna magna, even when accompanied by brain trauma, did not cause the disease. No explanation for these results is given but it is recommended that intracerebral injections with a $\frac{1}{4}$ -in. needle or direct intracisternal injection should be used for performing neutralisation tests in order to obtain uniform results. (16 photomicrographs.)

C. J. C. B.

Time factor in equilibrium between blood and cerebrospinal fluid. M. RISER, P. VALDIGNIE, and J. GUIRAUD (Compt. rend. Soc. Biol., 1938, 127, 262—264).—Following intravenous injection of urea (dog), the blood-urea rapidly rises, but the cerebrospinal fluid-urea concn. does not increase as would be expected from the law of Derrien. Equilibrium is attained only after 9 hr. After tying the ureters the concns. in blood and cerebrospinal fluid agreed with the calc. vals. in $4\frac{1}{2}$ hr.

D. N.

Effect of pitressin and water intake on the cerebrospinal fluid (C.S.F.). J. N. CUMINGS and N. S. ALCOCK (J. Neurol. Psychiat., 1938, 1, 61—67).—Various constituents of the blood and C.S.F. were compared before and 4 hr. after the ingestion of 6 pints of water and the subcutaneous administration of 0.5 c.c. of pitressin. These substances were not similarly diluted in the blood and C.S.F. and in some instances certain constituents of the C.S.F. were increased in concn. Hydrocele fluid accurately reflected the changes in the blood. Therefore either C.S.F. is not a simple dialysate or there is selective absorption of certain constituents.

J. D.

Origin of the fall in the pressure of the cerebrospinal fluid (C.S.F.) after its artificial elevation

by jugular occlusion. T. H. B. BEDFORD (Brain, 1938, 61, 62—69).—Previous work has shown that after jugular occlusion the C.S.F. pressure is elevated, but returns to its original level within 1 hr.; the pressure in the torcular is also raised and tends to fall, but does not return to its original level. The problem was studied in dogs, using the same methods, but with the addition of a const.-pressure reservoir. This permitted the C.S.F. pressure to be maintained at any desired level and the interchange of fluid between the subarachnoid space and the reservoir to be measured. In one group of 15 experiments occlusion of the jugular veins plus maintenance of the new C.S.F. pressure resulted in an inflow of 0.049 c.c. per min. and a const. raised venous pressure for 1 to 1.5 hr. Jugular occlusion with maintenance of the original C.S.F. pressure caused in 12 experiments an immediate extrusion of fluid and thereafter either no external loss of fluid or a continuous extrusion of C.S.F. The pressure in the torcular was raised to a less extent than in the first group and was const. In four further experiments raising the C.S.F. pressure without occlusion caused an inflow of fluid. It was concluded that the return of C.S.F. pressure after jugular occlusion is due to a diminution in C.S.F. vol., probably by absorption in those sinuses least influenced by the raised venous pressure. The fall in venous pressure in the torcular is mainly dependent on the fall in pressure of the C.S.F.

J. D.

Chemical mediators in reflex excitation. D. E. ALPERN (J. Physiol. Path. gén., 1937, 35, 944—949).—In 12 out of 40 patients showing slowing of the pulse as a result of pressure on the eye-ball (Aschner phenomenon), "vagal substance" was detected (leech-muscle technique) in blood taken from the cubital vein. Much larger amounts were found in the cerebrospinal fluid. It was present in portal blood (dog) during digestive reflexes.

C. A. A.

Effect of preganglionic nerve section on ganglionic transmission. Z. M. BACQ and G. COPPÉE (J. Physiol., 1938, 92, 17—18p).—Titeca observed that section of a cat's motor nerve is followed within 30 hr. by a neuro-muscular block for which the Wallerian degeneration is not responsible. The present authors observed a similar block in the transmission of nerve impulses across the synapses of the superior cervical ganglion of the cat.

J. A. C.

Effect of preganglionic section on acetylcholine in ganglion. F. C. MACINTOSH (J. Physiol., 1938, 92, 22p).—The interval between section of the preganglionic fibres and failure of the superior cervical ganglion of the cat to transmit impulses corresponds with that during which the ganglion loses most of its preformed acetylcholine.

J. A. C.

Irradiation of second lumbar sympathetic ganglion in arthritis of the hip. DUHEM, MORO, and MONTMIGNANT (Presse méd., 1938, 153—154).—X-Radiation applied to the second lumbar sympathetic ganglion markedly relieved pain and stiffness in 25 cases of arthritis of the hip. The condition of the joint as seen by X-ray was unchanged.

P. C. W.

Effect of coeliac ganglionectomy on the sensibility against insulin and adrenaline. Y. SATOW (Tôhoku J. exp. Med., 1938, 32, 413—418).—Removal of the coeliac ganglion in rabbits increases the hypoglycaemic effect of insulin and diminishes the hyperglycaemic effect of adrenaline. A. S.

Study of visceral pain as related to the biliary tract. G. S. BERGH and J. A. LAYNE (Proc. Soc. Exp. Biol. Med., 1938, 38, 44—45).—Sudden distension of the bile duct with saline causes severe epigastric pain and sometimes subscapular pain. Gradual distension to the same pressure is painless. V. J. W.

Proprioception in insects. I. New type of mechanical receptor from the palps of the cockroach. J. W. S. PRINGLE (J. exp. Biol., 1938, 15, 101—113).—A group of campaniform sensilla occurs on each of the joints of the maxillary palp of *Periplaneta americana*. Each group is supplied from a single large sensory nerve fibre. Impulses in these nerves can be recorded at the base of the maxilla. The sensilla respond to passive straight or sideways bending of the joint, and to pressure on the cuticle. They respond less when the segment is moved actively by its own muscle. The observations support the view that the campaniform sensilla are "stress receptors" responding to strains in the cuticular skeleton. J. M. R.

Tarsal chemoreceptor response of the housefly, *Musca domestica*, L., to sucrose and fructose. C. C. DEONIER and C. H. RICHARDSON (Ann. Entom. Soc. Amer., 1935, 28, 467—474).—The sugars probably stimulate chemoreceptor organs on the tarsi, the response being smaller after feeding. Commercial and pure sucrose were similarly active, but fructose induced a smaller response. CH. ABS. (p)

(g) SPECIAL SENSES.

Law for minimal discrimination of intensities. III. W. J. CROZIER and A. H. HOLWAY (Proc. Nat. Acad. Sci., 1938, 24, 130—135).—Using the law for the response to flicker described by Crozier, Wolf, and Zerrahn-Wolf, and assuming that the standard deviations measure inherent variability in performance and not experimental error, a prediction is made of just discriminable differences in light intensity under given experimental conditions. The predicted vals. fit closely those found by experiment. W. F. F.

Formation of visual yellow and "visual white" during bleaching of visual purple. Y. HOSoya and Z. SAITO (Tôhoku J. exp. Med., 1938, 32, 399—409).—Visual yellow and "visual white" were found as intermediate stages during bleaching of visual purple extracted from the retina of summer frogs and toads. Visual yellow was formed after exposure to yellow (λ 590—570 m μ .) and blue light (λ 490—470 m μ .). A. S.

Preparation and spectroscopic examination of visual purple extracts. Z. SAITO (Tôhoku J. exp. Med., 1938, 32, 432—446).—Retinae of frogs, toads, rats, and carps, kept in darkness, are suspended in 45% solutions of glucose or sucrose; visual purple

is extracted by saponin, panax toxin, Na oleate, digitonin, or Na glycocholate. This prep. is free from pigment epithelium and gives pure absorption figures of the visual purple and its bleaching products. The max. absorption of the visual purple of carp occurs at λ 520 m μ . A. S.

Regeneration of visual purple extracts. Y. HOSoya and T. SASAKI (Tôhoku J. exp. Med., 1938, 32, 447—459).—Bleached visual purple regenerates in darkness only if the extract contains retinal pigment epithelium. A. S.

Sedimentation constant of visual purple. S. HECHT and E. G. PICKELS (Proc. Nat. Acad. Sci., 1938, 24, 172—176).—Visual purple is probably a carotenoid protein of high mol. wt. (cf. A., 1937, III, 341). The sedimentation const. of frog's visual purple is 11.1×10^{-13} cm./dyne/sec. This val. is of the same order of magnitude as that for some proteins; it is the same for the Hg blue or green line, indicating that the observed asymmetry of the visible absorption spectrum is an integral property of visual purple. The sedimentation const. is the same for bleached as for unbleached visual purple, indicating that there is no drastic splitting of visual purple on bleaching. The mol. wt. of visual purple is 200,000 from the sedimentation const. alone and 270,000 from sedimentation and diffusion consts. F. L. W.

Photosensitive pigments from the retina of the frog. A. M. CHASE (Science, 1938, 87, 238).—Frog's retinae were treated with 2% digitalin solution, the absorption spectrum of which was then measured, using Shlaer's photo-electric spectrophotometer. Exposure to extreme red light produced curves very different from those given by visual purple. It is suggested that these new curves are produced by a photosensitive pigment present in the cones. C. A. K.

Reflexion spectra of eye pigment in *Drosophila melanogaster* and its mutants. J. C. FARDON and M. J. CARROLL (Stud. Inst. Divi Thomae, 1937, 1, 197—205).—Reflexion spectra of the eyes (*in situ*) of *D. melanogaster* and mutants show that sepia eyes have the min. reflexion (covering 300 Å) and then, in order of increasing reflexion, vermilion, eosin, brown, "wild," and white eyes. The other colours, plotted on λ -intensity curves, are envelopes of sepia. It is concluded that only one pigment is involved in all these eye colours, differences in apparent colour being due to dilution. D. BU.

Structure of the retina and the rôle of its visual purple. R. J. LYTHGOE (Proc. Physical Soc., 1938, 50, 321—339).—A lecture.

Duplexity theory of visual response in vertebrates. W. J. CROZIER, E. WOLF, and G. ZERRAHN-WOLF (Proc. Nat. Acad. Sci., 1938, 24, 125—130).—In the turtle, *Pseudemys scripta*, a simple sigmoid curve describes the relation between flicker frequency and the mean light intensity producing response to flicker; the single curve is correlated with the absence of rods from the retina. Animals possessing both rods and cones give a double sigmoid curve relating flicker and mean intensity. W. F. F.

Response of single optic nerve fibres of the vertebrate eye to illumination of the retina.

H. K. HARTLINE (Amer. J. Physiol., 1938, 121, 400—415).—Action potentials in single optic nerve fibres of cold-blooded vertebrate eyes may be obtained from small intraocular bundles dissected off the anterior surface of the retina of excised, opened bulbs. Different single fibres show different responses. Three types of responses exist: (a) bursts of impulses at onset of illumination followed by steady discharge at lower frequency maintained throughout illumination, and ceasing when light is turned off; (b) bursts of impulses at onset and cessation of illumination only; (c) discharge of impulses at cessation of illumination only. The type of response in any fibre is independent of conditions of stimulation or adaptation of the eye. Fish, amphibian, and reptilian eyes give essentially the same types of response. Responses in a given fibre are obtained only on stimulation of a certain restricted area of the retina (reception field of fibre). The type of response in a fibre does not depend on the location of its receptive field in the retina.

M. W. G.

Theory of retino-cerebral function with formulas for visual acuity and light and dark adaptation at the fovea. C. A. ELSBERG and H. SPOTNITZ (Amer. J. Physiol., 1938, 121, 454—464).—Formulae are given expressing the energy produced by light, and the relative val., for conscious vision, of different degrees of light stimulation. M. W. G.

Osmotic pressure of aqueous humour in normal and glaucomatous eye. G. H. BENHAM, W. S. DUKE-ELDER, and T. H. HODSON (J. Physiol., 1938, 92, 355—360).—The molar concn. of aq. humour of man, dog, and cat is higher than that of the corresponding serum by an amount averaging 0.004M-NaCl. The immediate effect of ether anaesthesia is to reverse this normal relationship between blood and aqueous humour, the molar concn. of the blood being raised by 0.01M-NaCl. Pathological intra-ocular tension is not a simple function of the osmotic balance between the blood and aq. humour. The intra-ocular fluid is not a simple dialysate.

J. A. C.

Biochemistry of the lens. V. Ascorbic acid content of blood and urine of subjects with senile cataract. J. BELLOWS. VI. Mineral metabolism in normal and in cataractous lenses. J. E. LEBENSOHN (Arch. Ophthalmol., 1936, 15, 78—83, 217—221).—V. Blood-plasma and urine of cataractous subjects contain subnormal amounts of ascorbic acid. The quantity of vitamin-C necessary to increase the plasma-C is higher in cataractous cases than in normal.

VI. The nucleus of the lens contains a larger proportion of cations than does the cortex. In cataract Ca accumulates mainly in the nucleus. Approx. $\frac{1}{4}$ of the K and Na in the nucleus is indiffusibly bound to the protein. Increased Na in cataract compensates osmotically for loss of K. The ash of cortex is greater than of the nucleus on a dry matter basis but less in relation to water contents. CH. ABS. (p)

Blood-lipins in lipæmia retinalis. A. MARBLE and R. M. SMITH (Arch. Ophthalmol., 1936, 15, 86—

94).—Increased proportions of total lipins, fatty acids, phospholipins, and total and ester cholesterol occur in the disease, fatty acids showing widest differences.

CH. ABS. (p)

Visual acuity at low illumination as a test for night flying. C. E. FERREE and G. RAND (J. Aviation Med., 1937, 8, 116—120).—Rapid dark-adaptation is essential for night flying. In 68 observers under 28 years of age with normal vision, rapidity of dark-adaptation varied by 800%, and for the middle 50% of the group 159%. An instrument for testing light- and dark-adaptation is described.

C. P. S.

Serological investigation of the transparent media of the eye. Specific properties of crystallin. E. WOLLMAN, P. GONZALEZ, and P. DUCREST (Compt. rend. Soc. Biol., 1938, 127, 668—670).—Anti-crystallin serum from fish reacts not only with the crystallin (protein of the crystalline lens) from the same species but, to a smaller extent, with those of mammals and birds, whilst that from the octopus is inactive towards other species.

H. G. R.

Nature of acoustic response: the relation between stimulus intensity and the magnitude of cochlear responses in the cat. E. G. WEVER and C. W. BRAY (J. exp. Psychol., 1938, 22, 1—16).—In cats under deep urethane anaesthesia a Ag foil electrode was placed in contact with the round window, and the indifferent electrode in muscle at the edge of the incision. As sound stimulator, an audio-oscillator calibrated for both frequency and intensity was used. The responses were recorded on a cathode-ray oscillograph. The functional relationship between sound intensity and the magnitude of the responses in the cochlea was a power function for all except the highest intensities, which overloaded the ear. No absolute threshold for cochlear response was discovered.

A. G. M. W.

Audiometers and hearing aids. A. A. HAYDEN (J. Amer. Med. Assoc., 1938, 110, 722—725).—The comparative variations of 4 types of audiometers were determined. The audiometer is more useful for testing and recording hearing acuity than any other means now available for clinical practice.

R. L. N.

Effect of sound on ear in reptiles. E. D. ADRIAN (J. Physiol., 1938, 92, 9—11p).—In the common land tortoise and in the box tortoise the ear is extremely sensitive, judged by the nerve response, to sounds over a very narrow frequency range (105—115 cycles per sec.); sounds below 80 cycles and above 130 are usually without effect unless they are very loud; the Wever and Bray effect is absent. In the alligator, which has a membranous ear drum and a true cochlea, the frequency of the electric response follows that of the sound up to 1000 cycles or more; the Wever and Bray effect is present. In the grass snake loud sounds fail to produce any sign of activity in the 8th nerve; tactile stimuli and vibration of the supporting surface give an irregular discharge. Tortoises do not seem to appreciate the sounds to which their ears are sensitive.

J. A. C.

Effects of unilateral and bilateral labyrinthectomy in monkey, baboon, and chimpanzee.

R. S. DOW (Amer. J. Physiol., 1938, 121, 392—399).—Unilateral and bilateral labyrinthectomy in *Macaca mulatta* produced symptoms similar to those described by previous workers. In the chimpanzee the symptoms more nearly approach those in human subjects than in monkeys. The baboon in this respect is intermediate between the chimpanzee and the macaque. M. W. G.

Relation between sourness and p_H of saliva. L. H. CRAGG (Trans. Roy. Soc. Canada, 1937, [iii], 31, III, 7—13; cf. A., 1936, 289).—In general, the more acid is the saliva the greater is the apparent sourness of a solution of acetic acid. In addition to buffering there is some other mechanism for resisting change in acidity of saliva. J. N. A.

Sour taste; threshold values and accuracy, effects of saltiness and sweetness. L. H. CRAGG (Trans. Roy. Soc. Canada, 1937, [iii], 31, III, 131—140).—At the threshold concn. for HCl, H_2SO_4 , HNO_3 , chloroacetic, acetic, formic, and tartaric acids the p_H is 4.4 ± 0.2 . The relative accuracy of sour determinations is about the same for acids and buffers ($\pm 3\%$ of the concn.), is independent of sourness, and is not affected by addition of NaCl or sugar. Addition of 0.2M-NaCl does not affect the sourness, whilst 3% of sugar or saccharin of equal sweetness decreases the sourness of HCl by about 15% and of buffered solution by about 40%. In neither case is there any appreciable effect on p_H . The effect of a sweet substance in decreasing sourness of a solution is probably a psychological one. J. N. A.

(h) DUCTLESS GLANDS, EXCLUDING GONADS.

Fundamental principles of endocrine bioassays. J. C. MUNCH (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 57—61).—A review.

R. L. N.

Relationship between hormones, vitamins, and enzymes. S. THADDEA (Dtsch. med. Wschr., 1938, 64, 492—496, 539—542).—A review.

Influence of various hormones on the glutathione content of blood. III. Thyroxine and parathyroid extract. E. ZUNZ and O. VESSELOVSKY (Compt. rend. Trav. Lab. Carlsberg, 1938, 22, 562—570; cf. A., 1937, III, 492).—Intravenous injection of thyroxine into a chloralosed dog did not alter the reduced or oxidised glutathione content of blood. Intravenous injection of parathyroid extract increased reduced and total glutathione, but there was no conversion of oxidised into reduced form. This hyperglutathionæmia is not due to hyperadrenalinæmia. J. N. A.

Removal of the thymus and blood-calcium. I. ORNSTEIN and E. LUCINESCU (Compt. rend. Soc. Biol., 1938, 127, 1039—1040).—No change in blood-Ca was observed in dogs after thymectomy.

H. G. R.

Relation of growth to phosphorus, calcium, and lipin metabolism as influenced by the thymus. C. F. AHMANN (Florida Agric. Exp. Sta. Ann. Rept., 1933, 83, 1934, 57).—Thymectomised rabbits averaged 85% of the wt. of controls but matured

sexually at an earlier date. Offspring of thymectomised rabbits did not make normal growth. Castration increased, and dietary conditions causing emaciation diminished, the size of the thymus.

CH. ABS. (p)

Biological effects of thymus extract (Hanson) on thymectomised rats. N. H. EINHORN (Endocrinol., 1938, 22, 335—341).—Injections of the extract into five generations of thymectomised rats abolished the usual retardation in growth and development, which became actually accelerated beyond the normal rate. V. J. W.

Biological effects of thymus implantation in normal rats. N. H. EINHORN and L. G. ROWNTREE (Endocrinol., 1938, 22, 342—350).—Thymus grafts caused acceleration in growth and development in four generations of offspring, but not so markedly as injections of extract. V. J. W.

Enlargement of the thymus in infants with special reference to clinical evidence of so-called status thymico-lymphaticus. A. MONCRIEFF (Proc. Roy. Soc. Med., 1938, 31, 537—544).—Enlargement of the thymus was confirmed in 10 males and 2 females by X-ray examination. Symptoms occurred in the early months of life; stridor in 5, syncope and dyspnoea in 3, head retraction in 2, and cyanotic attacks, "fits," and dyspnoea each in 1 case; some exhibited more than one symptom. Treatment recommended is suitable irradiation immediately an enlarged thymus is suspected from the symptoms and confirmed by X-rays. W. J. G.

Generalised leukæmic scleroderma treated by parathyroidectomy with improvement. T. FUKUDA, T. KUSUNOKI, and S. KUWABARA (Sang, 1938, 12, 445—450).—The right superior parathyroid was removed. It weighed 91 mg. and showed fatty change.

C. J. C. B.

Effect of parathyroid extract on serum-calcium of nephrectomised dogs. R. ELLSWORTH and P. H. FUTCHER (Johns Hopkins Hosp. Bull., 1935, 57, 91—98).—In nephrectomised dogs administration of parathyroid extract markedly increased serum-Ca, plasma-vol., -inorg. PO_4''' , and -non-protein-N.

CH. ABS. (p)

Dose-response relationship in the U.S.P. XI parathyroid assay. L. C. MILLER (J. Amer. Pharm. Assoc., 1938, 27, 90—95).—The changes in serum-Ca due to administration of varying doses of parathyroid extract to dogs indicate that the U.S.P. XI method of assay is satisfactory provided significant but submax. responses are produced and that more than the min. of 5 dogs are used. Type of diet and fasting appear to have no effect on the response. The adoption of a standard reference prep. is advocated. F. O. H.

Forced calcification in experimental trichina (*Trichinella spiralis*) infections. T. VON BRAND, G. F. OTTO, and E. ABRAMS (Amer. J. Hyg., 1938, 27, 461—470).—Subcutaneous injections of parathormone in trichina-infected rats produced Ca deposits in trichina cysts similar to those following the feeding of irradiated ergosterol and to that occurring normally in old cysts, although more rapid in appearance. The use of parathormone, irradiated ergosterol, or

related substances to produce forced calcification as a therapeutic measure in human trichinosis was regarded as impracticable. G. P. G.

Thyroid and midbrain. F. HOFF, G. GENTZEN, and H. KLEMM (Klin. Woch., 1937, 16, 1305—1311).—Prominal inhibits in guinea-pigs the effects of thyroxine and thyrotropic hormone on metabolism and diminishes the metabolic rate of normal animals. No histological changes were found in the thyroids. Prominal also prevents the thyroxine effect on liver-glycogen. F. W. L.

Lowering of blood-iodine by midbrain narcosis in Graves' disease. E. FENZ and K. UBER-RAK (Klin. Woch., 1937, 16, 1125).—In normal and myxoedematous subjects prominal narcosis did not change the blood-I; in hyperthyroidism there was a fall. Basal metabolic rate and I vals. were often not parallel. F. W. L.

Cholesterol content of the organism after injection of thyroxine. H. VIGNES and G. GLO-MAUD (Compt. rend. Soc. Biol., 1938, 127, 585—587).—The cholesterol contents of various organs or of the whole animal (rat) could not be correlated with injection of thyroxine. H. G. R.

Change in physicochemical properties of blood-serum produced by hyper- and hypo-function of thyroid. H. KOIKE (Folia Pharmacol. Japon., 1936, 21, 324—335).—Animals with disturbed thyroid function show an increase in total serum protein and -albumin and a diminution in -globulin. Hypo- or hyper-function of the thyroid increases η and lability of sera but decreases the albumin/globulin ratio. CH. ABS. (p)

Present status of iodine in treatment of exophthalmic goitre. J. L. DE COURCY (Arch. Surg., 1936, 32, 346—354). CH. ABS. (p)

Pathological and biochemical changes in skeletal dystrophies. Results of treatment of parathyroid osteosis. E. L. COMPERE (Arch. Surg., 1936, 32, 232—272).—Paget's disease is probably due to hyperthyroidism; blood-Ca and -P are normal; the Ca balance in the chronic phase is positive and urinary Ca is subnormal. CH. ABS. (p)

Relief of myxoedema and cretinism by iodinated blood serum. J. LERMAN and W. T. SALTER (Proc. Soc. Exp. Biol. Med., 1938, 38, 94—96).—An I compound made by an undescribed method from serum-protein and I caused benefit in 6 hypothyroid patients. V. J. W.

New goitre-producing diet for the rat. G. R. SHARPLESS (Proc. Soc. Exp. Biol. Med., 1938, 38, 166—168).—A diet containing 75% of raw soya-bean flour caused a 3—5-fold enlargement in the thyroid of young rats. The addition of 0.4 mg. of KI to 1 kg. of the diet prevented the enlargement. V. J. W.

Effect of p_H on metamorphosing action of thyroxine on tadpoles. S. H. ROSEN (Proc. Soc. Exp. Biol. Med., 1938, 38, 171—176).—Tadpoles were placed in solutions of 1 in 2×10^6 thyroxine of p_H varying from 5 to 11. Acidity accelerated and alkalinity retarded the metamorphosing effect of the thyroxine. V. J. W.

Relation between iodine content and size and structure of the thyroid gland. J. SIGURJONSSON (Virchow's Arch., 1938, 301, 91—110).—The wt. of the thyroid glands of inhabitants of Iceland (10—16 g.) was smaller, and the I concn. per g. of tissue (0.83 mg.) higher, than the vals. found in other countries; the total I content was similar. The small size and high relative I content of the glands of Icelanders are attributed to the I-rich fish in the diet. The thyroid shows hyperplasia when the I content of the diet falls below a certain min. level. H. W. K.

Rates of growth, osseous development, and mental development in cretins as a guide to thyroid treatment. L. WILKINS (J. Pediat., 1938, 12, 429—438).—In 7 cases bone development was found to be the most reliable guide to the adequacy of thyroid extract treatment over long periods. Mental development often lagged behind the normal rate. Sufficient thyroid extract ($\frac{1}{3}$ —3 grains daily) should be given to cause a mild degree of hyperthyroidism; if bone development after a few months does not approach the normal level, the dose of thyroid extract is probably inadequate. C. J. C. B.

Iodine metabolism of patients suffering from endemic goitre in Jehol. Blood-iodine in (A) healthy and (B) thyroid disease patients. (C) Urinary excretion of iodine. N. ITO (J. orient. Med., 1938, 28, 46—48).—(A) Normal blood-I vals. in Japanese and Manchurians were, 10.9 $\mu\text{g.}\%$ (males) and 11.8 $\mu\text{g.}\%$ (females). These vals. are increased during menstruation and hot weather and decreased in cold.

(B) 21 endemic goitre cases had average blood-I of 8.4 $\mu\text{g.}\%$, 6 hyperthyroid cases with adenoma 20 $\mu\text{g.}\%$ and 2 endemic cretins 6 $\mu\text{g.}\%$. Thyroidectomy in a case of endemic goitre lowered the blood-I from 12 to 8.6 $\mu\text{g.}\%$. Average in simple goitre is 9.7 $\mu\text{g.}\%$.

(C) Urinary excretion of I of Japanese in Manchuria averages 123 $\mu\text{g.}$; Manchurians average 56 $\mu\text{g.}$. In the goitrous region in Jehol the average excretion is 31 $\mu\text{g.}$ and the goitre cases average 25 $\mu\text{g.}$. Goitre patients excrete less than the normal 70% of intake. P. C. W.

Effect of prolonged injections of thyroxine on the adrenals and blood pressure of rabbits. F. GERLEI (Endokrinol., 1938, 19, 387—400).—0.25—4 mg. of thyroxine was injected subcutaneously into rabbits over periods up to 2 years. Necrosis and cirrhosis occurred in the liver; the wt. of the adrenals, mainly of the cortex, was increased; the blood pressure was slightly raised. A. S.

Relation between thyroid gland and female sex organs. J. ADLER-MÖNNICH and R. TIBERT (Wien. Arch. inn. Med., 1938, 32, 41—46).—0.12—0.25 mg. of thyroxine injected daily for 7 days into guinea-pigs almost completely prevents the action of 2-5 rat units of prolactin on ovary and uterus. A. S.

Case of carcinoma of the islets of Langerhans with hypoglycæmia. H. JOACHIM and M. BANOWITZ (Ann. int. Med., 1938, 11, 1754—1759). C. A. K.

Action on islets of Langerhans of vitamin- B_{12} and C. Z. ASZODI and J. MOSONYI (Klin. Woch.,

1937, 16, 1214—1217).—An increase of blood-insulin in dogs is produced by intravenous injection of $-B_1$ and $-C$. $-C$ lowers blood-sugar after pancreatic extirpation. Immediately after double vagotomy, $-C$ increases the blood-insulin, but later this does not occur. F. W. L.

Use of zinc-protamine-insulin in diabetes mellitus of children and adults. R. WAGNER (Wien. med. Wschr., 1938, 88, 353—357).—29 diabetic children and adolescents were successfully treated with Zn-protamine-insulin. The no. of necessary daily injections was usually smaller than with insulin. The carbohydrate tolerance was increased in several cases. A. S.

Effect of protamine-zinc-insulin in cases of diabetes resistant to insulin. M. TAUBENHAUS (Wien. Arch. inn. Med., 1938, 32, 55—62).—Diabetics with hypertension, who reacted very little to insulin and dietary treatment, responded well to protamine-Zn-insulin. Fasting blood-sugar, which in spite of high doses of insulin was 200—330 mg.-%, was reduced by protamine-Zn-insulin (12—30 units) and diet to 110—140 mg.-%. A. S.

Zinc-protamine-insulin treatment of diabetes. H. SCHWAB (Presse méd., 1938, 140—142).—The new prep. is valuable in all cases, because of its steady and prolonged action. P. C. W.

Retard insulins. R. BOULIN (Presse méd., 1938, 137—140).—Diabetic cases were treated by subcutaneous injections of insulin in association with vasopressin or Zn. Although the hypoglycæmia was prolonged the action was too inconst. for clinical use. Zn-protamine-insulin, however, gave good results. The literature is reviewed. P. C. W.

Course of blood and spinal fluid glucose in man (schizophrenics) after shock doses of insulin. G. W. DAY, E. O. NIVER, and M. M. GREENBERG (Amer. J. clin. Path., 1938, 8, 206—213).—Following shock doses of insulin (50—220 units) the blood-glucose dropped rapidly for 1—1½ hr. often to below 20 mg.-% and then dropped slowly to a level, even as low as 10 mg.-%, at which it remained practically const. The spinal fluid-glucose dropped very irregularly; sometimes it fell as low as the blood-glucose in 3½ hr. but in most cases did not fall as low in 4 hr. The fall in the spinal fluid was due either to the utilisation of glucose by the nervous tissue when the blood-sugar was so low that no more glucose would be transferred, or to retransference of glucose to the blood as the glucose level fell in the blood. C. J. C. B.

Insulin increases the glycogen and decreases the lipin content of the liver of the depancreatized dog. P. CRISTOL, L. HÉDON, A. LOUBATIERES, and P. MONNIER (Compt. rend. Soc. Biol., 1938, 127, 581—583).—The increase in liver-glycogen is accompanied by a decrease in muscle-glycogen. The I val. decreases with the lipin content of the liver but no change occurs in the lipin-P. H. G. R.

Action of insulin in cell-free extracts. H. LEHMANN (Nature, 1938, 141, 690).—An inhibition of glycogen breakdown in muscle extract can be produced by the addition of minute amounts of

insulin. The same effect can be demonstrated using extract of dried yeast as enzyme. It is the irreversible formation of Embden ester which is inhibited. L. S. T.

Experimental diabetes and tuberculosis in dogs. M. M. STEINBACH, S. J. KLEIN, and M. W. DESKOWITZ (Amer. Rev. Tuberc., 1935, 32, 665—676).—The increased susceptibility to tuberculosis after pancreatectomy is due to absence of insulin secretion. CH. ABS. (p)

Chronic atrophic arthritis: effect of a high-carbohydrate diet and insulin on symptoms and respiratory metabolism. B. D. BOWEN and L. M. LOCKIE (J. Lab. Clin. Med., 1936, 21, 505—521).—Patients with advanced arthritis utilised a high-carbohydrate diet normally. CH. ABS. (p)

Replacement of adrenaline in the suprarenals and the splanchnic nerves. Y. SATOW (Tôhoku J. exp. Med., 1938, 32, 257—267).—Subcutaneous injections of eserine (1 to 2 mg. per kg. body-wt.) diminish considerably the adrenaline content of the adrenals. Subsequent denervation of the adrenals does not influence the time necessary for the glands to re-form adrenaline. A. S.

Can section of the splanchnic nerves or removal of the adrenal glands or their medulla modify the glycaemic effect of adrenaline? M. TIBA (Tôhoku J. exp. Med., 1938, 32, 419—431).—The hyperglycaemic effect of adrenaline in rabbits after double adrenalectomy, removal of the adrenal medulla, or section of both splanchnic nerves is not different from that in normal animals. A. S.

Increased blood-amino-acid caused by glycine and the secretion of adrenaline. E. S. ECHAGUE (Compt. rend. Soc. Biol., 1938, 127, 1107—1109).—Increased secretion of adrenaline follows an increase in the blood-amino-acid caused by intravenous injection of glycine. H. G. R.

Nicotine and secretion of adrenaline. H. HERMANN, F. JOURDAN, G. MORIN, and J. VIAL (Compt. rend. Soc. Biol., 1938, 127, 1131—1133).—Secretion of adrenaline decreases in intensity and finally ceases after repeated injection of nicotine, although the adrenal gland can still be stimulated by KCl or acetylcholine, or electrically. H. G. R.

Action of adrenaline on the coronary vessels and general circulation after [administration of] diethylaminomethylbenzodioxan (883F). D. DANIELOPOLU and I. MARCOU (Compt. rend., 1938, 206, 692—694).—The vasodilator action of 0.02 mg. of adrenaline on the coronary vessels (heart-lung prep.) is almost abolished by the previous injection of 0.03 g. of 883F. Intravenous injection of 0.2 mg. of adrenaline greatly increases the coronary venous flow in a dog (luminal), the flow in the femoral vein being first increased and then diminished. 0.05 g. of 883F lowers the coronary and increases the femoral venous outflow; 0.1—0.2 mg. of adrenaline now slightly increases both but has little effect on the blood pressure. J. L. D.

Slowly absorbed adrenaline preparation. E. L. KEENEY (Johns Hopkins Hosp. Bull., 1938, 62,

227—229).—Subcutaneous injections of adrenaline in olive or arachis oil suspension, prepared by subjecting the mixture to supersonic radiation for 7 min., were more beneficial to asthmatics (because of a more prolonged and delayed action) than were injections of simple aq. preps. Arachis was less irritating on injection than olive oil. T. F. D.

Oxidation and reduction of adrenaline in the body. M. OKAGAWA and H. ICHITSUBO (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 155).—Tyrosinase inactivates and homogenetic acid and Na_2SO_3 reactivate adrenaline in the body. CH. ABS. (p)

Effect of amino-acids on iodic acid equivalent of adrenaline. K. TERAI and H. ICHITSUBO (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 155).—Amino-acids did not influence the HIO_3 titration of adrenaline, and, in alkaline solution, did not delay the decomp. of adrenaline. CH. ABS. (p)

"Adrenoxine"; its production from adrenaline and its action. Z. M. BACQ (J. Physiol., 1938, 92, 28—29p).—When adrenaline in dil. solution (10^{-5} — 10^{-7}) is oxidised at neutral p_H by tyrosinase (mushroom) or pyrocatechol-oxidase (potato), an inhibitory (vaso-dilator) substance ("adrenoxine") is formed, between the production of adrenochrome and melanin. With the exception of intestine, a pyrocatechol-oxidase exists in all smooth muscles inhibited by adrenaline. Extracts of virgin cat's uterus and of frog's bladder and stomach oxidise pyrocatechol, pyrogallol, and adrenaline to melanin. In the presence of 0.002M-resorcinol or of a small concn. (10^{-5}) of progesterone, the phenolasic action of the extracts is inhibited. J. A. C.

Effect of temperature on response of gut to adrenaline. H. BLASCHKO and H. SCHLOSSMAN (J. Physiol., 1938, 92, 26p).—With the rabbit's intestine the response is more marked at 30° than at body temp. This observation is useful for assay of adrenaline. J. A. C.

Effect of ascorbic acid on the action of adrenaline and thyroxine. M. SHIMAMURA (Folia Pharmacol. Japon., 1938, 25, 31—32).—The influence of adrenaline and thyroxine on gut movements and blood-sugar of normal or scorbutic guinea-pigs is unchanged by ascorbic acid. A. S.

Comparison of the weights of adrenals of dogs in oestrus, pregnancy, and lactation. D. D. BAKER (J. Morph., 1938, 62, 3—16).—Statistical study of the ratio of medulla to cortex and of the ratio of adrenal wt. to body-wt. in 188 dogs in and near oestrus (76 pregnant, 23 pseudo-pregnant, and 12 lactating) shows that the only significant change is the decrease in wt. of the glands as the animals pass into metoestrus. H. A. HA.

Renal function in normal and adrenalectomised opossums and effects of post-pituitary and cortico-adrenal extracts. H. SILVETTE and S. W. BRITTON (Amer. J. Physiol., 1938, 121, 528—534).—Adrenalectomised opossums given 1% NaCl solution by mouth are unable to excrete the ingested salt and water. Administration of post-pituitary extract

under the same conditions led to considerable increases in water and salt excretion. When given 0.1% NaCl solution by mouth the adrenalectomised opossums excreted more water and salt than normal animals, and the administration of post-pituitary extract to such animals led to a further increase in water, Na, and Cl excretion. The injection of cortico-adrenal extract to adrenalectomised opossums given 0.1% NaCl solution resulted in a marked reduction in Na and Cl excretion. M. W. G.

Effect of adrenalectomy on blood-phospholipins and total fatty acids in the cat. E. H. YEAKEL and E. W. BLANCHARD (J. Biol. Chem., 1938, 123, 31—38).—After bilateral adrenalectomy, the lipins in whole blood, plasma, and erythrocytes decreased in spite of increased haematocrit vals. During adrenal cortical insufficiency, the ratio of cell-to plasma-lipins increased markedly. The loss of lipins from plasma and the possible effects on water balance are discussed. J. N. A.

Influence of adrenalectomy upon the sex difference in ketosis. E. M. MACKEY and R. H. BARNES (Endocrinol., 1938, 22, 351—353).—Urinary ketones resulting from a fatty diet are present normally in greater amount in the female. In rats after adrenalectomy they fall to the same low level in both sexes. V. J. W.

The rat in the assay of cortin. F. E. D'AMOUR and D. FUNK (J. Pharm. Exp. Ther., 1938, 62, 307—317).—The average survival period of 422 adrenalectomised male rats, 30 days old, was 5.7 days. Less than 4% survived indefinitely. Changes in diet had little effect on the survival period, with the exception of added salt, which doubled it. Such rats were suitable for the assay of cortin, given orally once a day. The unit adopted was that amount of cortin required per day per rat (using 5 or more) to maintain life in 80% for 10 days, and giving a net increase in wt. of 10% during this period. E. M. S.

Use of adrenal cortex extract in glaucoma. A. C. WOODS (Arch. Ophthalmol., 1935, 14, 936—946).—Beneficial results are claimed. CH. ABS. (p)

Relation of the adrenal glands at autopsy with clinico-pathological findings and with blood-vitamin-C. W. FREEMAN and W. E. GLASS (Amer. J. clin. Path., 1938, 8, 197—205).—In 42 consecutive cases central cavitation of the adrenal was associated with a blood-reduced ascorbic acid level below 0.7 mg.-%. C. J. C. B.

Bitterling ovipositor reaction to corticosterone. W. FLEISCHMANN and S. KANN (Science, 1938, 87, 305—306).—Corticosterone caused marked growth of the ovipositor of female bitterlings on injection or on addition to the water of the aquarium. C. A. K.

Effect of adrenal cortical extracts on intermediary nitrogenous metabolism. M. LANDSBERG, H. SZPIDBAUM, and I. DWORECKI (Compt. rend. Soc. Biol., 1938, 127, 1146—1149).—Intravenous injection of adrenal cortical extracts decreases the blood-non-protein-N, particularly the polypeptide-N, and slightly increases the urea level. H. G. R.

Influence of adrenal cortical hormone preparations on the spontaneous activity of the normal albino rat. V. E. HALL and O. H. MÜLLER (Amer. J. Physiol., 1938, 121, 537—541).—3 preps. of adrenal cortical hormone administered in doses of 0.32—1.0 rat unit had no effect on spontaneous activity of normal albino rats in rotating cages.

M. W. G.

Effects of adrenal cortical extract in rest and work. V. MISSIARO, D. B. DILL, and H. T. EDWARDS (Amer. J. Physiol., 1938, 121, 549—554).—The injection of $\frac{1}{2}$ —1 c.c. daily for 3—5 days (in human subjects) of cortical adrenal extract increased the efficiency of easy walking tests but had no effect on anaërobic work. The blood pressure in the early stages of recovery was lower and the resting val. was reached sooner in all cases after the administration of cortin.

M. W. G.

Use of the low salt diet in the diagnosis of Addison's disease. A. LILLENFELD (J. Amer. Med. Assoc., 1938, 110, 804—805).—The application of the diagnostic, salt-free diet therapy to a suspected case of Addison's disease resulted in death.

R. L. N.

Aspects of anterior lobe function, suggested by a cytological analysis of experimentally altered glands. A. E. SEVERINGHAUS (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 144—150).—A review.

R. L. N.

Observations on histologic structure of anterior pituitaries of old female rats. J. M. WOLFE, W. R. BRYAN, and A. W. WRIGHT (Proc. Soc. Exp. Biol. Med., 1938, 38, 80—82).—26 rats of 543—848 days old were examined. Their pituitaries contained areas of hypertrophied cells, usually chromophobes and vacuolated, resembling pituitary adenomata.

V. J. W.

Inhibitory action of acetylcholine on water-diuresis in the dog. M. PICKFORD (J. Physiol., 1938, 92, 16—17p).—The observations suggest that the inhibition is due to a release of posterior pituitary hormone. Acetylcholine was given intravenously, 0.2 mg. in 0.2 c.c. of 5% acid Na phosphate; peripheral effects were prevented by 1 mg. of atropine sulphate intravenously.

J. A. C.

Tolerance and fate of the pressor principle of posterior pituitary extract in anaesthetised animals. E. LARSON (J. Pharm. Exp. Ther., 1938, 62, 346—362).—Tolerance to the pressor principle of pituitary extract is due, in part, to persistent contraction of the spleen and constriction of intestinal vessels. There is no compensating dilatation of kidney and muscle. Section of the vagi and evulsion of the carotid sinus nerves augment the pressor response. After injection of large doses of pituitary extract, up to 25% is rapidly eliminated in the urine. The pressor principle is inactivated by enzyme solutions from liver, kidney, blood, or muscle, the effective tissue ereptase being aminopolypeptidase.

[B.] E. M. S.

"Latent period" in diabetes insipidus. A. D. KELLER (Proc. Soc. Exp. Biol. Med., 1938, 38, 31—35).—Administration of anterior pituitary extract does not abolish the temporary cessation of polyuria

which takes place 2—6 days after hypothalamic lesions, and which is therefore not due to operative depression of the anterior pituitary.

V. J. W.

Rôle of the melanophore-dispersing hormone of the pituitary in the colour changes of the catfish. C. M. OSBORN (Proc. Nat. Acad. Sci., 1938, 24, 121—125).—The pituitary of *Ameiurus nebulosus* secretes a melanophore-dispersing agent which is an important factor in the darkening stage of the colour change reaction. Functional amounts of the active material remain in the circulation for about 70 hr. after hypophysectomy. A blinded fish is black on all illuminated backgrounds (melanophore diameter 130—140 μ .); blinded and hypophysectomised fishes disperse the melanophores to diameter of only 70—75 μ .

W. F. F.

Differential migration of pressor and oxytocic hormones in the electrophoresis of untreated press-juice of posterior lobe of pituitary gland. G. W. IRVING, jun., and V. DU VIGNEAUD (J. Biol. Chem., 1938, 123, 485—489; cf. A., 1938, III, 437).—During electrophoresis of chemically untreated, mechanically expressed juice of fresh glands, the pressor principle travelled to the cathode faster than the oxytocic principle.

J. N. A.

Cushing's syndrome. C. W. DUNNE (Endocrinol., 1938, 22, 374—385).—11 cases received considerable benefit from the administration of progynon B alone or with progynon DH.

V. J. W.

Relation of narcolepsy, polycythæmia, and obesity to Cushing's syndrome. A. SPITZ (Dtsch. Arch. klin. Med., 1938, 181, 286—304).—3 cases are reported with obesity, polycythæmia, and narcolepsy. Post-mortem examination in 2 cases showed an increase of the basophils of the anterior pituitary and hypertrophy of the adrenal cortex. The clinical differences from Cushing's syndrome are discussed.

A. S.

Pituitary dystopia. M. RATZENHOFFER (Virchow's Arch., 1938, 301, 17—27).—A normally developed pituitary gland was found outside the sella turcica, which was extremely shallow and had no diaphragm. The ventricular septum of the heart showed an opening admitting the 5th finger. No clinical or anatomical changes were found which could be attributed to the malposition of the pituitary. Both the malformation of the heart and the misplacement of the pituitary are attributed to an abnormal development of the mesodermal tissue.

H. W. K.

(A) **Pituitaries of the fin-back (*Balaenoptera physalus*) and sperm (*Physeter megalocephalus*) whales.** E. M. K. GEILING, L. N. TARR, and A. DEL. TARR. (B) **Assay of fin-back whale anterior pituitary powder.** Z. WALLEN-LAWRENCE. (C) **Assay of sperm whale anterior pituitary powder.** O. RIDDLE and L. BATES (Johns Hopkins Hosp. Bull., 1935, 57, 123—135, 135—138, 139).—Extracts of the acetone-dried posterior lobes of these pituitaries possess pressor, diuretic, and oxytocic activity. The anterior lobes contain the melanophore principle, the gonadotropic, thyrotropic, and adrenotropic hormones, and small amounts of prolactin.

CH. ABS. (p)

Spleen and anterior pituitary. F. SAUERBRUCH and E. KNAKE (Klin. Woch., 1937, 16, 1268—1270).—Splenectomy in man and animals results in increased excretion of urinary prolactin. F. W. L.

Relation of pituitary to spleen. I. Effect of hypophysectomy on growth and regeneration of spleen tissue. II. Presence of a spleen-stimulating factor in anterior pituitary extracts. D. PERLA (J. Exp. Med., 1936, 63, 599—615).—The stimulating factor occurs in small amounts in alkaline extracts of fresh anterior pituitary which also contain growth and gonadotropic factors but not in acid extracts which contain thyrotropic and adrenotropic factors. It is also present in alkaline extracts of acetone-dried pituitary which is relatively free from growth hormones. CH. ABS. (p)

Effect of anterior pituitary extract on the response of the denervated heart to adrenaline. M. E. M. SAWYER, C. W. HAMPEL, and G. C. RING (Amer. J. Physiol., 1938, 121, 555—564).—Administration of anterior pituitary extract increases the response of the denervated heart to adrenaline; removal of the anterior pituitary diminishes it. The extract raises basal metabolic rate by 20%. Thyroidectomy abolishes the stimulating action of the extract. The anterior pituitary increases the sensitivity of the denervated heart to adrenaline indirectly by increasing the activity of the thyroid. M. W. G.

Antibodies organ-specific against anterior body of pituitary gland. O. KESTNER (J. Physiol., 1938, 92, 273—275).—The sp. dynamic action (10 g. of raw meat) in rats is considerably lowered by a serum organ-sp. against the anterior body. J. A. C.

Quantitative assay of growth-promoting extract of the hypophysis. C. CHOU, C. CHANG, G. CHEN, and H. B. VAN DYKE (Endocrinol., 1938, 22, 322—334).—The largest and most consistent growth responses can be obtained by daily administration to hypophysectomised rats for a period of not more than 10 days. V. J. W.

Effect of antithyrotropic serum on the action of human thyrotropic hormone. C. L. COPE (Lancet, 1938, 234, 888—890).—Antithyrotropic serum prepared in rabbits against ox thyrotropic hormone antagonises the latter on injection into guinea-pigs, but has a negligible effect on human thyrotropic hormone. Owing to this species-specificity such serum is unlikely to be of val. in the treatment of Graves' disease. C. A. K.

Thyroid and sex hormone. Antithyroid action of large amounts of progynon. H. ZAIN (Klin. Woch., 1937, 16, 1351—1352).—Rats were employed. Progynon influences the deranged carbohydrate metabolism of hyperthyroidism via the pituitary. F. W. L.

The thyrotropic hormone and the hormone problem. S. C. WERNER (Endocrinol., 1938, 22, 291—301).—A Na_2SO_4 extract of ox pituitary, whether given in small non-stimulating doses or large stimulating ones, caused refractoriness to thyrotropic hormone within 39 days. A flavianic acid extract

caused stimulation and rarely refractoriness, and it produced no anti-hormone when given to rabbits or sheep. It also stimulated thyroid growth in 9 out of 11 guinea-pigs which had become refractory to the Na_2SO_4 extract. V. J. W.

Biological assay of the carbohydrate metabolism hormone of anterior pituitary gland. A. J. BERGMAN and C. W. TURNER [with P. T. CUPPS] (J. Biol. Chem., 1938, 123, 471—477).—The method of assay is described. The unit of the hormone is equiv. to the min. amount of pituitary extract injected intraperitoneally into well nourished male guinea-pigs weighing 180—220 g. which causes after 8 hr. an average increase of 50% in the blood-sugar of five or more animals. Sheep and cattle pituitary glands extracted with 60% alcohol at p_{H} 9—10 yielded about 250 units per g. of dried extract. J. N. A.

Diabetogenic action of crude anterior pituitary extracts. F. G. YOUNG (Biochem. J., 1938, 32, 513—523; cf. A., 1937, III, 379).—Of the animals investigated, the dog is the most sensitive to the diabetogenic factor of the anterior pituitary; the mouse, rat, and guinea-pig are almost insensitive. This factor produces an effect only after 4 or 5 injections and is distinct from substances, absent from crude anterior pituitary extracts, which produce an immediate rise in blood-sugar. Acetone desiccation of the gland partly destroys the active factor, which must be extracted from the fresh gland at low temp. P. G. M.

Carbohydrate utilisation in the hypophysectomised dog. S. SOSKIN, R. LEVINE, and R. E. HELLER (Proc. Soc. Exp. Biol. Med., 1938, 38, 6—8).—The hypophysectomised dog uses carbohydrate about half as effectively as the normal dog, and a dog which is hypophysectomised and depancreatized uses sugar at rates varying from the rate of the depancreatized dog to $\frac{2}{3}$ of that rate. V. J. W.

Fractionation of diabetogenic extracts of anterior pituitary extracts. F. G. YOUNG (Biochem. J., 1938, 32, 524—533).—Injection of purified prolactin, glycotropic factor, or thyrotropic factor does not produce diabetes in dogs; these three factors are therefore distinct from the diabetogenic factor, although the last two may be associated with it. P. G. M.

Action of Young's glycotropic factor of anterior pituitary gland. H. P. HIMSWORTH and D. B. MCN. SCOTT (J. Physiol., 1938, 92, 183—207).—In rabbits in which the liver has been completely excluded from the circulation, the pituitary glycotropic factor inhibits the action of insulin in accelerating the removal of blood-glucose by the peripheral tissues, but it does not affect the rate at which these tissues use glucose spontaneously. The liver is essential for the production of hyperglycaemia after injection of insulin into rabbits treated with the glycotropic factor; this hyperglycaemia occurs only if injection of insulin disturbs the blood-sugar level. Animals which have received the glycotropic factor react to a fall in blood-sugar by an excessive liberation of sugar from the liver into the blood. Neither the thyroid, nor the hypophysis, nor the adrenal glands

are necessary, in rabbits, for the action of the glycotropic factor in antagonising the effects of insulin.

J. A. C.

Determination of the ketogenic activity of extracts of endocrine organs. C. H. GRAY (Biochem. J., 1938, 32, 743—755).—Previous work on variations in ketonuria in rats on a high-fat diet, and on the ketogenic action of pituitary extracts on fasting and fat-fed rats and fasting rabbits, is confirmed. The most consistent ketogenic response is found in fasting rats. After 36 hr. fasting, anterior pituitary extracts produce in female rats an increase in liver-fat followed by ketonuria but in male rats a much greater ketonuria and a very slight increase in liver-fat. In general, a large ketogenic response is accompanied by a small increase in liver-fat, and conversely.

E. M. W.

Pituitary regulation of the male gonad. R. O. GREEP (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 136—143).—A review.

R. L. N.

Gonadotropic hormones. H. L. FEVOLD (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 93—103).—A review.

R. L. N.

Gonadotropic hormone and the level of blood-phosphorus in the hen. M. LASKOWSKI (Acta Biol. Exp., 1937, 11, 273—275).—Serum-vitellin can be made to appear in the blood of non-laying pullets by injection of pituitary or mare's serum-gonadotropic hormone. At the same time lipin-P is greatly, and inorg. P slightly, increased. In laying hens the same changes are produced but to a smaller extent. Anterior pituitary lobe hormones from urine have no action.

R. T.

Preparation, properties, and use of gonad-stimulating hormones. L. E. CASIDA (J. Dairy Sci., 1938, 21, 101—108).—The prep. from pituitary glands of slaughter animals and from urine and blood serum of pregnant females is described. Properties, standardisation, and uses are discussed.

W. L. D.

Production of antisera to preparations of prolactin containing glycotropic (anti-insulin) factor of anterior pituitary gland. F. G. YOUNG (Biochem. J., 1938, 32, 656—664).—Average wt. of young reared by lactating mice receiving daily injections of these antisera (rabbit) is slightly less than that of controls, probably owing to partial inhibition of milk secretion in the mothers of the former. Rabbits receiving daily injections of prolactin for 18 weeks exhibit a normal hypoglycaemic response to insulin after the administration of a potent pituitary glycotropic prep., i.e., they are insensitive to the glycotropic action of the extract. No evidence is found that this insensitivity is transmissible to normal animals by the serum of the resistant rabbits (cf. A., 1938, III, 294).

J. A. C.

Effects of chronic injection of rats with extract of pituitaries of the same species. P. A. KATZMAN, N. J. WADE, and E. A. DOISY (Proc. Soc. Exp. Biol. Med., 1938, 38, 122—126).—10 female rats, 55—60 days old, received daily injections of extract of 2 rat anterior pituitaries for 107—255 days. All

showed ovarian and uterine hypertrophy and their serum had no antigonadotropic property.

V. J. W.

Effect of synthetic androgen on the gonadotropic potency of the anterior pituitary. J. B. HAMILTON and J. M. WOLFE (Endocrinol., 1938, 22, 360—365).—Rats were injected daily with 500 µg. of testosterone propionate for 30 days. When their pituitaries were grafted into young females some increase was caused in ovarian and uterine wt. but less than by the pituitaries of untreated controls.

V. J. W.

Chick testis weight response to gonadotropic hormone. T. C. BYERLY and W. H. BURROWS (Endocrinol., 1938, 22, 366—369).—Pregnant mare serum injected into day-old male chicks causes after 72 hr. an increase in testis wt. which is logarithmically proportional to the dose of hormone given.

V. J. W.

Experimentally induced ovulation in dwarf mice. C. M. OSBORN (Endocrinol., 1938, 22, 370—373).—Ovulation was brought about in 9 out of 12 dwarf mice by giving daily injections for 5 days of follicle-stimulating hormone, and one of luteinising hormone with the last of the five.

V. J. W.

Action of merthiolate on the gonadotropic effect of anterior pituitary extract. G. CHEN and H. B. VAN DYKE (J. Pharm. Exp. Ther., 1938, 62, 333—345).—The potency of gonadotropic extract of sheep pituitary, as estimated by the effects of subcutaneous injection into immature female rats, was increased by merthiolate (Na ethyl mercurithio-salicylate) in concn. of 0.02% or higher. The effect depended on concn. rather than total dose of merthiolate. No potentiation occurred when the 2 substances were injected simultaneously at different sites. Merthiolate did not augment the gonadotropic effect of pregnancy urine. Local inflammatory effects of merthiolate on the subcutaneous tissues probably slow the absorption rate and so augment the effect of anterior pituitary extract.

E. M. S.

Assay of gonad-stimulating preparations. M. C. D'AMOUR and F. E. D'AMOUR (J. Pharm. Exp. Ther., 1938, 62, 263—283).—Preps. of pregnancy urine, placenta, and sheep pituitary were assayed by different methods. With the method based on increase in wt. of seminal vesicles and ovaries, males were more sensitive than females to urine and placenta, but less to pituitary, for which males were unsatisfactory as test animals. The oestrous smear test was satisfactory for urine, but not for pituitary, whereas assay based on production of corpora lutea gave similar results with both preps. Of the two methods (ovarian wt. and corpora lutea) applicable to both urine and pituitary, the ovarian wt. method was preferred, although less sensitive, because the results were more objective.

E. M. S.

Concentration of the anterior pituitary gonadotropic hormones and urinary prolans by ultra-filtration. A. T. BERNARD (Compt. rend. Soc. Biol., 1938, 127, 644—645).—The gonadotropic hormones can be separated from folliculin in urine by ultra-filtration, the product being less toxic than the alcoholic ppt.

H. G. R.

Standardisation of gonad-stimulating hormones. P. G. MARSHALL (Nature, 1938, 141, 605).—The vaginal smear method in rats is the best for the standardisation of gonad-stimulating hormones in urine and pregnant mare serum. C. A. K.

(j) REPRODUCTION, HEREDITY, AND EXPERIMENTAL EMBRYOLOGY.

Recent advances in the field of adrogens. F. C. KOCH (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 34—43).—A review. R. L. N.

Testis hormone secretion and effects of the hormone in the organism. C. R. MOORE (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 115—122).—A review. R. L. N.

Factors involved in the control of the gametogenic and endocrine functions of the testis. W. O. NELSON (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 123—135).—A review. R. L. N.

Effect of androgenic substances on testes and accessory reproductive organs of immature male guinea-pig. A. C. BOTTOMLEY and S. J. FOLLEY (J. Physiol., 1938, 92, 15—16P).—Androgens, except androsterone and *trans*-dehydroandrosterone, cause a marked regression of the testes, due apparently to suppression of the anterior pituitary body. J. A. C.

Further effects of androgenic substance on sexual development in the female white rat. R. R. GREENE, M. W. BURRILL, and A. C. IVY (Proc. Soc. Exp. Biol. Med., 1938, 38, 1—3).—Testosterone compounds were given to 152 pregnant rats of which 55 went to term. The female young of those receiving 3.5 mg. and upwards of testosterone showed various male characters, including non-fusion of the Mullerian ducts, an epididymis, vas deferens, and seminal vesicles. V. J. W.

Masculinisation of female rats by postnatal administration of male sex hormone. R. R. GREENE, M. W. BURRILL, and A. C. IVY (Proc. Soc. Exp. Biol. Med., 1938, 38, 4—5).—Administration of 10—17 mg. of testosterone propionate to new-born female rats causes some masculinisation of the external genitals. V. J. W.

Gonadotropic action of rat pituitary after treatment with testosterone propionate. J. G. H. BOKSLAG and L. A. VAN DER WOERD (Acta brev. neerl. Physiol., 1938, 8, 9—11).—43.8 µg. of testosterone propionate was subcutaneously injected daily in male rats for 8 days; their pituitary glands were then grafted intraperitoneally in young female mice. The wt. of the uteri 3 days later was greater than that of untreated controls. A. S.

General muscular hypertrophy induced by androgenic hormone. G. N. PAPANICOLAOU and E. A. FALK (Science, 1938, 87, 238—239).—Testosterone propionate produced general muscular hypertrophy in castrated immature male, and spayed and normal adult female, guinea-pigs. This effect was not seen with oestrogenic hormones, but occurs in adult females with gonadotropic hormone. The

above may explain the higher muscular development of the male mammal. C. A. K.

Biological differences in the action of synthetic male hormones on the differentiation of sex in the chick embryo. B. H. WILLER, M. E. RAWLES, and F. C. KOCH (Proc. Nat. Acad. Sci., 1938, 24, 176—182).—Androsterone, dehydroandrosterone, and testosterone propionate were injected into eggs prior to or during the formation of the gonad primordium. 34% of those treated with androsterone and dehydroandrosterone survived and 74% of those treated with the propionate. The first two have both masculinising and feminising effects, whereas the last has masculinising effect only on the development of the gonads and gonoducts. The first two stimulate development of ovarian cortex and persistence of the oviducts in genetic males. In genetic females they have an inhibitory action on these components, *i.e.*, the action in genetic females is wholly masculinising whereas in genetic males both feminising and masculinising effects occur, the former being the greater. F. L. W.

Determination of (capon) comb growth hormone in urine. E. DINGEMANSE and E. LAQUEUR (Biochem. J., 1938, 32, 651—656; cf. A., 1937, III, 186).—When urine after addition of 10 or 150 c.c. of 25% HCl per litre is heated for two periods of 6 hr. in presence of benzene, no loss of comb growth-promoting substances occurs. When free androsterone and/or dehydroandrosterone is added to urine previously freed from comb growth-promoting substances and the urine is treated in the same way with 25% HCl and benzene, the recovery is quant., but if benzene is absent, loss of 60% of activity occurs in 15 min. and more than 80% in 2 hr. Urine boiled with 10 vol.-% of 25% HCl in absence of benzene for 15 min. may lose none of its male hormone activity; boiling for 2 hr. causes some loss and no dehydroandrosterone can be detected. J. N. A.

Effect of androgenic substances on rate of teat growth in male guinea-pig. A. C. BOTTOMLEY and S. J. FOLLEY (J. Physiol., 1938, 92, 33—34P).—Unsaturated androgens, with the exception of androstenedione, exhibit definite teat growth-promoting activity, *trans*-androsterdiol being the most active; testosterone is one fourth as active as the latter. J. A. C.

Histological variations of the testes from normal and sexually abnormal castrated men. K. SAND and H. OKKELS (Endokrinol., 1938, 19, 369—374).—Histological comparison of the testes of normal subjects and of subjects who were castrated for sexual abnormalities showed no difference. Wide variations in the structure of the testes occur. Only 17 out of 72 testes corresponded with current views of "normality." Thickening of the basement membrane of the seminiferous tubules, oedema of the stroma, changes of the Leydig cells and of the spermatogenic tissue with diminution of spermatogenesis were observed in both groups of testes. A. S.

Pressure device for separation of mammalian spermatozoa from the isolated epididymis.

E. J. CZARNETZKY and W. HENLE (Proc. Soc. Exp. Biol. Med., 1938, 38, 63—64).—A cannula is inserted into the cut end of the vas deferens and fluid is forced in until the epididymis is distended. It is then incised and the contents are collected.

V. J. W.

Composition and physiological significance of the seminal fluid of the trout. W. SCHLENK, jun., and H. KAHMANN (Biochem. Z., 1938, 295, 283—301; cf. A., 1933, 1199).—The fluid contains Na⁺ 0.1334, K⁺ 0.0202, Cl⁻ 0.1302, SO₄²⁻ 0.0099, and PO₄³⁻ 0.0012 milliequiv. per c.c. The K specifically prevents the movement of the spermatozoa in the undiluted fluid and the total salt concn. maintains their ability to move when the fluid is diluted. Na has no sp. effect and can be replaced by an equiv. amount of K. The reversible inhibition of the motion produced by change in [H⁺] is due not to free H⁺ but to non-dissociated ionogenic groups or mols. containing H. The motion occurring when the fluid is diluted with water is attributed to fall in [K⁺]; it is followed by destruction of the cilia but not if the appropriate salt concn. is maintained. W. McC.

Estrogenic diols from the urine of pregnant mares. O. WINTERSTEINER (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 25—33).—A review.

R. L. N.

Metabolism of ovarian hormones, especially in relation to the growth of the fertilised ovum. G. PINCUS (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 44—56).—A review, supplemented by personal observations.

R. L. N.

Effects of oestrin and progestin in the rabbit. W. M. ALLEN (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 66—83).—A review.

R. L. N.

Hormonic and physical factors in uterine growth. S. R. M. REYNOLDS (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 84—92).—A review.

R. L. N.

Reactions of the genital tissues to oestrogens. E. ALLEN (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 104—110).—A review.

R. L. N.

Problems in experimental menstruation. E. T. ENGLE (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 111—114).—A review.

R. L. N.

Molecular structure in relation to oestrogenic activity.—See A., 1938, II, 230.

Phenol methyl ethers as oestrogenic agents. B. ZONDEK and E. BERGMANN (Biochem. J., 1938, 32, 641—645).—The oestrogenic activities of the methyl ethers of oestrone and oestradiol are only slightly less than those of the non-methylated compounds, the free hydroxyl group not being essential for their action. Fennel and anise oils and, to a very slight extent, eucalyptus oil have oestrogenic properties which are attributed to the presence of anethole. Dihydroanethole, veratraldehyde, and pure anol (*p*-propenylphenol) have slight activity. Some of the substances tested showed higher activities with non-castrated infantile rats than with castrated adult mice.

J. N. A.

Constitution of equol.—See A., 1938, II, 197.

Activation of female sex hormones. K. MIESCHER, C. SCHOLZ, and E. TSCHOPP (Biochem. J., 1938, 32, 725—732).—(Estradiol produces a transitory oestrus in rats. Activators, particularly stearyl alcohol, considerably increase the duration of the response. Aliphatic di-esters are effective for long periods, duration increasing with the no. of C atoms in the acid, but the threshold val. also rises. 3-Benzoyl 17-aliphatic esters are more effective than 17-benzoyl 3-aliphatic. The dibenzoate has a very high threshold val. In the uterus growth test oestradiol is more active than oestrone. All di-esters tested show intense and prolonged effects. In both tests oestradiol di-esters are more effective than oestrone esters. A. T.

Response of fowl to massive dosage of oestrone and testosterone. C. W. EMMENS (J. Physiol., 1938, 92, 27—28p).—Brown Leghorn capons each received a single tablet of 5—20 mg. of testosterone propionate implanted into the breast muscle; the combs grew to full size in 5 weeks but commenced to atrophy at 9—10 weeks after implantation. Combs of normal Brown Leghorn hens treated with injections of 25 mg. per week of testosterone propionate in oil solution showed similar but less marked growth. Adult Brown Leghorn cockerels received injections of oestradiol benzoate in oil (10 mg. fortnightly, then weekly); in 2 months the comb atrophied to the level of a caponised bird. The result is due to depression of gonadotropic activity of the pituitary. J. A. C.

Cyclical fluctuations in the sensitivity of rats to oestrogenic stimulation. S. ZUCKERMAN (J. Physiol., 1938, 92, 12—13p).—Castillo and Calatroni's finding that oestrus recurs periodically in a group of spayed rats, which are injected daily with a const. low dose of oestrin, is confirmed. The accessory reproductive organs of female mammals are affected cyclically and directly by some extra-ovarian factor.

J. A. C.

Adrenals and pituitary in relation to cyclical changes in oestrin-sensitivity of rat. S. ZUCKERMAN (J. Physiol., 1938, 92, 13—14p).—If an endocrine mechanism is implicated in the occurrence of cyclical changes in the sensitivity of the rat to oestrogenic stimulation, the adrenal cortex and not the pituitary is the gland likely to be concerned.

J. A. C.

Action of follicular hormone. J. VON BALO and B. PURJESZ (Klin. Woch., 1937, 16, 1150—1152).—Daily injection of dogs with 50,000 units of keto-hydroxyoestrin for 20 days produced a diminution of erythrocytes and thrombocytes, and a leucocytosis, severe acidosis, and death. Bone marrow changes resembling myeloid leukemia and changes in the prostatic epithelium were found.

F. W. L.

Proliferative changes taking place in the epithelium of the vagina and cervix of mice with advancing age and under the influence of experimentally administered oestrogenic hormones. V. SUNTZEFF, E. L. BURNS, M. MOSKOP, and L. LOEB (Amer. J. Cancer, 1938, 32, 256—289).—The development of epithelial processes into the connective tissue of the vagina and cervix of old female mice and the incidence of new growths are increased by the oestrogenic substances. The changes are gradual and form a

continuous series; they are not compatible with the view that somatic mutations are the immediate cause of the cancerous transformation. E. B.

Substances with female hormone effect.—See A., 1938, II, 236.

Criteria for the selection of oestrous rabbits. M. H. FRIEDMAN (Endocrinol., 1938, 22, 354—359).—No correlation exists between oestrus and either vaginal colour or duration of isolation. Oestrus, defined as readiness to copulate, is always present for 2—30 days post-partum. V. J. W.

Induction of oestrous changes in the monkey and bitch by triphenylethylene. J. M. ROBSON (Proc. Soc. Exp. Biol. Med., 1938, 38, 153—157).—Oestrous changes in the vagina and uterus were caused after ovariectomy in the monkey and bitch and after hypophysectomy in the bitch. No toxic effects were produced by much larger doses. V. J. W.

Administration of oestrone to young alligators. T. R. FORBES (Science, 1938, 87, 282—283).—Injection of oestrone into sexually immature alligators of both sexes produced testicular and ovarian cortical hypertrophy, and marked hypertrophy of the oviducts and male Müllerian duct segments (without affecting the Wolffian ducts of either sex). There was no inhibition of the testicular or ovarian medulla. C. A. K.

Conjugated oestrogens. G. F. MARRIAN (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 16—24).—The separation and assay of the conjugated oestrogens in human pregnancy urine and pregnant mare's urine are described. The physiological significance of the vals. obtained during pregnancy and urinary excretion is discussed. R. L. N.

Androgenic activity of ovarian grafts. R. DEANESLY (J. Physiol., 1938, 92, 34—35P).—Ovarian grafts were made in the ears of rats castrated when immature. Some evidence of androgenic activity was obtained whether the rats were kept in a heated animal room or on a partly exposed balcony. The activity seems to be associated with luteinisation of the theca interna of the follicles in the grafts. J. A. C.

Inhibiting effect of corpus luteum on the growth-stimulating action of oestrin. E. MOORE, J. E. SMADEL, K. F. KOENIG, and L. LOEB (Growth, 1937, 1, 119—129).—The growth reaction of the vaginal epithelium produced by oestrin in immature and spayed guinea-pigs is inhibited in normal animals by the corpus luteum especially at the middle of the sexual cycle. The persistent corpus luteum of hysterectomised animals and of pregnancy exerts a strongly inhibiting action. The pseudolutein structures produced in the guinea-pig by injection of human pregnancy urine exert an inhibitory action similar to that of the normal corpus luteum. The inhibitory action is not a simple neutralisation, because the usual growth of the mammary glands takes place. W. F. F.

Action of folliculin on normal cocks' combs. V. RÉGNIER (Compt. rend. Soc. Biol., 1938, 127, 519—521).—Folliculin depresses the growth of cocks' combs

before and after puberty in the same way as does castration. D. N.

Influence of follicular hormone on grafted uteri. D. S. ELEFTHERIOU (Endokrinol., 1938, 19, 375—386).—Injections of large doses of follicular hormone into guinea-pigs into which uteri of other guinea-pigs had been transplanted led to complete necrosis of the graft. A. S.

The menopause and its management. E. NOVAK (J. Amer. Med. Assoc., 1938, 110, 619—622).—Only a small percentage of menopausal cases show vasomotor symptoms which require organotherapy. Treatment by oestrogens or irradiation of the hypophysis yields the most satisfactory results. R. L. N.

Maintenance and prolongation of pregnancy in hypophysectomised rabbits by oestrogenic substances. J. M. ROBSON (J. Physiol., 1938, 92, 11P).—The pituitary was removed in rabbits 21 days after mating and daily doses of 3—10 µg. of oestrone or 5 µg. of oestradiol (dissolved in oil) were then given. In another series removal was performed on the 28th or 29th day after mating and daily doses of 10 µg. of oestrone or 5 µg. of oestradiol were given. In a third series removal took place on the 21st—29th day of pregnancy and then 40 µg. of triphenylethylene were given daily. Gestation was maintained or prolonged in all cases and the corpora lutea were large and histologically similar to those seen towards the end of a normal pregnancy. J. A. C.

Inhibition of parturition in the rabbit by injection of oestrogenic hormone. G. P. HECKEL and W. M. ALLEN (Science, 1938, 87, 302—303).—Daily injections of oestradiol monobenzoate into pregnant rabbits from the 27th to the 31st day onwards postponed delivery in most cases. The foetuses died within a few days but were retained in utero, up to as long as the 52nd day in one case. Injections given to animals castrated on the 27th day of pregnancy had no effect. It is suggested that oestrogens injure the placenta (and so kill the foetus), and at the same time maintain the corpora lutea, the foetus thus remaining in utero. C. A. K.

Relation between female sex hormone and dewlap in the rabbit. C. HU and C. N. FRAZIER (Proc. Soc. Exp. Biol. Med., 1938, 38, 116—119).—The administration of human pregnancy urine extract to mature rabbits of either sex causes the development of a pronounced dewlap such as is normally present in half the adult females only. The dewlap disappears after ovariectomy or if the hormone administration is discontinued, and it is not produced before the age of 6 months. V. J. W.

Effect of certain hormones on activity of uterine muscle of mouse. G. H. BELL and J. M. ROBSON (J. Physiol., 1938, 92, 131—135).—The activity of the uterine muscle was studied *in vivo* in four groups of mice: (1) spayed and uninjected; (2) spayed, then treated with oestrone; (3) spayed, then injected with oestrone and progesterone; (4) spayed and injected with oestrone and testosterone. In (1) the response to oxytocin (*i.e.*, sensitivity) and the spontaneous activity are small. In (2), (3), and

(4) the sensitivity and the spontaneous activity are—equally in all three—greater than in (1). The same end effect on the sensitivity of the uterus at parturition is apparently brought about in different species by different hormone mechanisms.

J. A. C.

Rate of secretion of progestin by the corpus luteum. G. W. CORNER (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 62—65).—A review.

R. L. N.

Pubertas præcox due to dextrolateral granulosa cell tumour of the ovary in a 4-year-old girl. E. MANNHEIMER (J. Pediat., 1938, 12, 350—356).—The patient showed menstruation, marked secondary sex characteristics, increased growth in length, and early ossification of the bones. The tumour was removed by operation and contained folliculin. After the operation menstruation ceased and the secondary sex characters regressed to some extent.

C. J. C. B.

p_H of cultures of mammalian ovary in a gelatinous fluid deprived of animal substances. S. GOTHÉ (Compt. rend. Soc. Biol., 1938, 127, 991—993).—The effect of gelatin and gum arabic on the p_H of the culture was examined.

H. G. R.

Reflexes controlling lactation. J. FREUD and I. A. WIJSENBEK (Acta brev. neerl. Physiol., 1938, 8, 11—13).—The uterus of rats was opened opposite the placenta at various stages of pregnancy, and the foetus (within the amniotic sac) transferred into the abdominal cavity. The foetus survived the operation and was artificially delivered 19 to 25 days after conception. No lactation occurred before the termination of pregnancy. It is concluded (contrary to Selye, 1934) that the inhibition of milk secretion before delivery is not due solely to a reflex set up by uterine distension.

A. S.

Fibro-adenoma of the breast during pregnancy and lactation. C. S. MORAN (Arch. Surg., 1935, 31, 688—708).—Relations between changes in the tumours and hormonal activities are examined.

CH. ABS. (p)

Transmission of ragweed pollen antigen through the breast milk. A. STERLING and A. E. FISHMAN (Arch. Pediat., 1938, 55, 172—177).—Symptoms of an allergic nature, sneezing, wheezing, and dyspnoea, were noticed in a 6-weeks-old infant breast-fed by a mother who was receiving injections of 1% ragweed pollen extracts. The milk was shown, by incomplete tests, to contain some ragweed pollen antigen.

C. J. C. B.

Relationships of calcium in the blood serum to calcium balance and basal metabolism during pregnancy. S. I. PYLE, M. POTGIETER, and G. COMSTOCK (Amer. J. Obstet. Gyn., 1938, 35, 283—289).—3-day Ca balance experiments were carried out in pregnant women. The relation of serum-, food-, urinary, and faecal Ca to wt. gain and O_2 consumption is considered.

C. P. S.

Biological properties of gonadotropic extract of pregnant mare serum. I. W. ROWLANDS (J. Physiol., 1938, 92, 18—19f).—In the immature rat ovaries over 200 mg. wt. are obtained with this extract,

which also causes rapid development of quiescent follicles of aneestrous ferrets. Further it produces great enlargement of the uterus in the immature guinea-pig or rabbit, indicating a plentiful secretion of oestrogen by the ovary. A general relationship exists between ovulation-producing and follicle-stimulating capacity of the extract.

J. A. C.

Effect of human and animal urine and of sera on the ovaries of animals. A. STRICKLER (Amer. J. Cancer, 1938, 32, 249—255).—Injection of sera from the chicken and steer into virgin female rabbits had no effect; sera from the rooster and cow produced hæmorrhage or congestion. Plymouth Rock chickens were injected with the urine of pregnant women at 2 and 7 months, and also with the urine of advanced cancer patients. The sera from the birds were injected into virgin rabbits, into normal chickens and chickens with the Rous sarcoma. Sera of chickens injected with the urine of 7 months pregnant women and sera from the treated Rous chickens produced hæmorrhage in rabbit ovaries. The other urines were less effective. Urine of pregnant women (2 months) was injected into young chickens; 11 cases out of 47 showed premature ovaries. When lecithin and cholesterol were added to the urines, hæmorrhage was produced in 43% and premature ovaries in 35% of cases.

E. B.

Sex hormone excretion of children. R. B. OESTING and B. WEBSTER (Endocrinol., 1938, 22, 307—314).—Extracts of children's urine were assayed for male hormone by a colorimetric method, previously checked by capon comb measurements, and for female hormone by their effect on vaginal smears of ovariectomised mice. There is a gradual rise in the excretion of both hormones from early childhood to adult life with a peak at puberty.

V. J. W.

Sexual abnormalities in an inbred strain of mice. E. FEKETE (Proc. Soc. Exp. Biol. Med., 1938, 38, 59—62).—Certain individuals of a particular strain of mice appear externally to be normal females but internally have the reproductive organs replaced by structures resembling embryonic or undescended testes, which may become malignant.

V. J. W.

Extra-hormonal factors in maternal behaviour. C. P. LEBLOND (Proc. Soc. Exp. Biol. Med., 1938, 38, 66—70).—Maternal behaviour can be initiated and maintained in some adult mice by the presence of young in the cage and is therefore not solely dependent on hormonal factors.

V. J. W.

Hormone therapy in gynaecology. F. BERNHART (Wien. med. Wschr., 1938, 88, 433—440).—A review.

A. S.

Effect of placenta on body-weight of mouse. J. B. BROOKSBY and W. H. NEWTON (J. Physiol., 1938, 92, 136—150).—The loss of wt. which takes place in mice on the delivery of retained placenta (pseudoparturition), when the foetuses have been destroyed and have disappeared from the uterus with the amniotic fluid some days earlier, is due to elimination of an excess of water which is held in the maternal tissues (in general) so long as the placenta are retained. This excess of water is eliminated by a restriction of intake combined with a normal rate

of excretion. No conclusions can be drawn at present regarding the significance of the water retention. The balance of evidence is in favour of an endocrine function for the placenta. J. A. C.

Study of certain dietary factors of possible ætiologic significance in toxæmias of pregnancy. R. A. ROSS, W. A. PERLZWEIG, H. M. TAYLOR, A. MCBRYDE, A. YATES, and A. A. KONDRITZER (Amer. J. Obstet. Gyn., 1938, 35, 426—440).—Addition of dried milk, vitamins, Ca, and Fe to a basic diet of protein, vitamins, and minerals did not effect the incidence of toxæmia in 54 patients. There was no effect on concn. of red cells, hæmoglobin, plasma-proteins, fats, or lipins. M. H.

Ætiology of eclampsia. W. B. PATTERSON, H. F. HUNT, and R. E. NICODEMUS (Amer. J. clin. Path., 1938, 8, 120—135).—Pregnant rabbits, unlike women, developed a hypocholesteræmia in the last two thirds of pregnancy. Total thyroidectomy produced a hypercholesteræmia in the non-pregnant but not in the pregnant rabbit. The blood-cholesterol of foetuses of total thyroidectomised rabbits was over 100% higher than in foetuses of normal rabbits; the thyroid glands of the former group showed marked hyperplasia. The thyroidectomised rabbits died in convulsions shortly before term with toxic hepatitis and nephritis and infarcted placenta with severe endarteritis of the placental arteries. Hypercholesteræmia in the rabbit, produced by feeding cholesterol, causes a similar endarteritis. It was concluded that the foetal hypercholesteræmia causes placental infarction. Eclampsia has a pathological and physiological basis identical with the syndrome in pregnant thyroidectomised rabbits. Administration of thyroid extracts lowers the human hypercholesteræmia in the last two trimesters of pregnancy and thus there must be a sub-clinical hypothyroidism present. Maternal hypothyroidism plus hypercholesteræmia causes foetal hypothyroidism and hypercholesteræmia which may lead to placental infarction. Toxins absorbed from the degenerating placenta produce changes in the maternal organs. C. J. C. B.

Clasping reflex in frogs and toads and the seasonal variation in the development of the brachial musculature. C. L. SMITH (J. exp. Biol., 1938, 15, No. 1, 1—9).—A clasping action (peculiar to the male) can be produced in frogs at all times of the year by electrical stimulation of the body and of the central nervous system. The course of the decline and onset of the hypertrophy of the brachial musculature up to a max. at the breeding period can thus be followed. This hypertrophy follows closely the changes occurring in the interstitial tissue of the testis (cf. Aren, 1926). J. M. R.

Sexual cycle of the South African clawed toad (*Xenopus laevis*). I. S. S. ALEXANDER and C. W. BELLERBY. II. C. W. BELLERBY. III. C. W. BELLERBY and L. HOGGEN (J. exp. Biol., 1938, 15, 74—81, 82—89, 91—100).—I. Retrogression of the ovaries occurs if *X. laevis* is kept for long periods in an insufficient vol. of water. Atrophy takes place in spite of regular feeding and change of water and occurs more frequently and to a greater extent than

in toads which are underfed. Overcrowding is followed by a diminution in food intake, the weekly consumption of food being halved in the case of females subjected to the max. population density. Under natural conditions the seasonal decrease in water vol. of the ponds in which *Xenopus* lives may induce or at least contribute to the maintenance of the retrogressive phase of ovarian activity which normally occurs.

II. When maintained at an optimum nutritional level both sexes grow at a normal rate in the complete absence of light, or after removal of the eyes. No atrophic changes take place in the ovaries and testes of eyeless animals after 18 months or in the gonads of male and female toads kept in abs. darkness for 7 months. There is no evidence that light is essential for the maintenance of reproductive activity in this toad or that seasonal variations in light intensity or λ influence the sexual cycle under natural conditions.

III. Removal of the whole pituitary gland of *X. laevis* or of the anterior lobe alone is accompanied by reduced food intake, diminished growth of the body as a whole, and retrogression of the gonads in both sexes. Since there is no significant reduction in the main food reserves (corpora adiposa) the retrogression of the gonads is not the direct result of reduced food intake or an all-round lower metabolic level. The reduction of food intake is greater in females than in males. The metabolic demands of the gonads seem to control food intake. Since the food demand of the active ovary far exceeds the min. requisite for body growth, the results confirm the view that seasonal variations of food supply are mainly responsible for seasonal variations in the conditions of the ovaries of *Xenopus* in its natural habitat.

J. M. R.

Relationship of fertility to age in women. O. KOLB (Münch. med. Wschr., 1938, 85, 502—505).—Statistical study of 59,117 obstetrical cases shows that optimal fertility occurs at the age of 23. The fertile period begins at the age of 12 and ends at 49.

A. S.

Differentiation of genital cells. R. NOËL, H. PIGEAUD, and C. AMBRE (Compt. rend. Soc. Biol., 1938, 127, 339—340).—A rabbit, after X-irradiation of the testes, impregnated 3 females, which had 18 young (all female). Two X-irradiated female pigeons (out of 8) had only male offspring. D. N.

Embryology of the guinea-pig. II. The polydactylous monster. A new teras produced by the genes PXPx. J. P. SCOTT (J. Morph., 1938, 62, 299—321).—A detailed study of Wright's polydactylous monster (produced by a semi-dominant lethal gene) indicates that it belongs to a general type found also in rare human cases. The diagnostic characteristics are: clubbed feet and approx. double the usual number of digits, embryonic posture, micropthalmia and enlargement of the diencephalon, missing tibia, and telescoped sternum; all organ systems in the body except the genital and circulatory are grossly abnormal. The defects appear to be produced by an arrest of morphogenesis and an alteration of relative growth rates. It is indicated that a controlling centre of digit formation exists on

the lateral (postaxial) side of the foot, that skeletal and dermal structures are controlled by it, but that muscles are differentiated according to the area of the limb in which they lie. The gene itself is not atavistic, although its effects in the heterozygote have that appearance. H. A. HA.

Chemical fluctuations of the oyster in Norwegian breeding fields. T. GAARDER (Compt. rend. Trav. Lab. Carlsberg, 1938, 22, 173—181).—Before breeding commences, there is a decrease in wt. of flesh, but in 3 weeks this rises to its original val. and there is increase in protein, fat, and carbohydrate, but not glycogen. During spawning and the subsequent fasting period, the % of fat and glycogen decreases whilst protein and ash increase. The female stage is characterised by the lowest protein and ash, and highest fat and glycogen contents, whilst the converse holds for the male stage. In the marked hunger period, still more extreme vals. are reached than in the male stage. J. N. A.

Ovalbumin of logger-head turtle. K. KONDO (Compt. rend. Trav. Lab. Carlsberg, 1938, 22, 275—281).—Three proteins have been isolated from the white of the egg: globulin-I, pptd. by $(\text{NH}_4)_2\text{SO}_4$ to 50% saturation, globulin-II, pptd. by $(\text{NH}_4)_2\text{SO}_4$ to 66% saturation, and an albumin pptd. along with globulin-II but sol. in water. The isoelectric point of the albumin is p_{H} 5.7—5.8, and the N equiv. refractivity of its solution varies inversely with concn., but alters in val. with p_{H} and is max. at isoelectric point. The albumin contains more tryptophan and tyrosine than hen ovalbumin, and its coagulating point is 73.5°. J. N. A.

Handbuch der Anatomie des Kindes. Vol. 2, Part 5. Edited by Drs. K. PETER, G. WETZEL, and F. HEIDERICH (J. F. Bergmann, Munich, 1938, pp. 845—928).—The main characteristics in the growth of the child from birth to adolescence are summarised. The section dealing with the anatomy of the newborn is followed by two sections devoted to the anatomy of the premature child and the anatomy of the child during the neonatal period. H. A. HA.

Obstetrical criteria in North China. II. Weights and measurements of the mature newborn child. G. KING and Y. T. T'ANG (Chinese Med. J., 1937, 52, 501—506).—1000 mature newborn children (521 males and 479 females) were weighed and measured, particular attention being paid to skull dimensions. The vals. obtained were all slightly lower than Western standards. P. C. W.

Physical traits of Peiping children. I. Stature and weight measurements from one month to three years of age. R. A. GUY, C. C. CHIANG, H. H. HUANG, and K. S. YEH (Chinese Med. J., 1937, 52, 507—518).—Wt. and length measurements in 1000 children between the ages of 1 month and 3 years showed slightly lower averages than those of a similar Iowa survey. P. C. W.

Segregation of "cleavage-substance" in the unfertilised egg of *Dendroaster excentricus*. A. R. MOORE (Proc. Soc. Exp. Biol. Med., 1938, 38, 162—163).—When these eggs are centrifuged at high speeds they afterwards show irregularities in their

cleavages which indicate that the cleavage process is dependent on a substance which becomes conc. at one region of the egg and causes cleavage there while the other parts of the egg fail to develop. V. J. W.

Rôle of glutathione in the action of the embryonic juice on the growth of cultures of fibroblasts *in vitro*. J. VERNE and A. VERNE-SOUBIRAN (Compt. rend. Soc. Biol., 1938, 127, 1090—1092).—Glutathione is one of the growth factors present in the juice. H. G. R.

Heredity and chemistry. A. KÜHN (Ber., 1938, 71, [4], 107—114).—A lecture. H. W.

(k) DIGESTIVE SYSTEM.

Mitochondria and metachondria of salivary gland (parotid and submaxillary gland) cells. T. SEKINE (Jap. J. exp. Med., 1938, 16, 21—51).—In the resting stage in white rats, the parotid cells showed a fine network of well stained metachondria (secretory granules) in the peripheral zone and a few mitochondria in the basal zone. After feeding, the cells showed many filamentous mitochondria but no network; the latter returns as the gland becomes less active. The submaxillary gland cells are filled with large metachondria without mitochondria. After feeding or when pilocarpine, insulin, histamine, atropine, adrenaline, Na glutamate, or choline is injected in suitable dose, the secretory granules diminish and mitochondria of various forms appear. When extracts of parotid or submaxillary gland are injected intraperitoneally, they show a relative sp. action, the parotid extract chiefly causing exhaustion of the parotid cell granules with appearance of mitochondria, but acting less on the submaxillary cells. Other organ extracts caused little or no effect. C. J. C. B.

Salivary glands of octopus. E. HOLZLÖHNER (Z. Biol., 1938, 98, 479—496).—Experiments were made on the isolated nerve-gland prep. of octopus. Histological changes during periods of rest and of stimulation of the secretory nerve were observed. The cells contain "giant granules" of regular form; during stimulation due partly to the contraction of smooth muscle fibres the granules are released into the secretory duct, and disintegrate. Acetylcholine has no, adrenaline little, stimulating effect on secretion. Deformation of the gland and rate of secretion are recorded photographically. Water secretion by the gland may be due to water absorption by the breakdown products of the granules. B. K.

General health at maturity of tonsillectomised and non-tonsillectomised children. M. C. HARDY (J. Pediat., 1938, 12, 463—472).—In a long-term investigation of 521 individuals, there was no conclusive evidence of outstanding differences in general health between young people whose tonsils had been removed in childhood and those who ignored the advice to have the operation. C. J. C. B.

Effectiveness of the Sippy regimen in neutralising the gastric juice of patients if the amount of alkali is not varied. P. H. WOSIKA and E. C. EMERY (Ann. intern. Med., 1936, 9, 1070—1077).—

Control is possible if free acidity does not exceed 20 after an alcohol test meal. CH. ABS. (p)

Permeability to ovalbumin in peptic ulcers. M. B. MARKS (Amer. J. digest. Dis. Nutr., 1936, 3, 41—44).—In cases without gross lesions in the mucosa of the upper portions of the alimentary tract, there is no egg precipitin reaction in urine. Positive tests were obtained with 75% of cases with active peptic ulcers. CH. ABS. (p)

Causes of faulty digestion in dogs without stomachs. E. S. EMERY, jun. (Amer. J. digest. Dis. Nutr., 1935, 2, 599—608).—Totally gastrectomised dogs were unable to utilise N and fat as readily as do normal animals. Absorption of fat becomes normal if allowed to enter the duodenum at a rate approx. that of leaving the normal stomach. CH. ABS. (p)

Pepsin in human gastric juice. III. Physiological aspects. A. E. OSTERBERG, F. R. VANZANT, W. C. ALVAREZ, and A. B. RIVERS (Amer. J. digest. Dis. Nutr., 1936, 3, 35—41).—The pepsin concn. of gastric juice was higher and more variable during fasting than during feeding and very high after histamine treatment. Secretion of pepsin and of acid diminished with age and was greater in men than in women. CH. ABS. (p)

Double histamine test as an aid in study of gastric secretory function. A. B. RIVERS, A. E. OSTERBERG, and F. R. VANZANT (Amer. J. digest. Dis. Nutr., 1936, 3, 12—15).—The technique of the test is described and some applications are recorded. CH. ABS. (p)

Gastric secretion during introduction of food into the jejunum. F. MARET (Dtsch. Arch. klin. Med., 1938, 181, 305—317).—Food was introduced by means of a tube pushed into the jejunum of patients with gastric or duodenal ulcers; gastric juice was aspirated through another tube in the stomach. The secretion of gastric juice, and total and free HCl increase 10 min. after introduction of food into the jejunum; this is followed by diminished secretion. A. S.

Distribution of chloride in the gastric mucous membrane of the dog. I. GERSH (Proc. Soc. Exp. Biol. Med., 1938, 38, 70—72).—Portions of mucous membrane are frozen in liquid N₂, dried in vac. at -60°, and embedded in paraffin. Sections are stained with AgNO₃, when chlorides appear as black particles. All the gland cells were free from Cl⁻ in the cytoplasm, but there were traces in the granules. It was present in the lumen, along the free border of the gland cells, and in the submucous connective tissue. V. J. W.

Gastric vagi in the dog. Erroneous assumption of uninterrupted innervation in the Pavlov pouch. E. E. JEMERIN and F. HOLLANDER (Proc. Soc. Exp. Biol. Med., 1938, 38, 139—146).—Both anterior and posterior gastric vagi pass along the lesser curvature of the stomach and thence send off branches towards the greater curvature where no vagal trunk exists. 75% of these branches are cut by the Pavlov incisions and the pouch so made is practically denervated. V. J. W.

Blood-sugar level and gastric secretion in various diseases of the stomach. W. CHRISTLIEB (Dtsch. Arch. klin. Med., 1938, 181, 394—412).—The hyperglycaemic phase after ingestion of 100 g. of glucose is followed in patients suffering from gastric and duodenal ulcers or from gastritis by a sudden decrease of blood-sugar to 30 to 40 mg.-%. There is a marked increase of gastric juice and HCl during this hypoglycaemic state. A. S.

Mechanism of external pancreatic secretion. T. CHRISTIANSEN (Compt. rend. Trav. Lab. Carlsberg, 1938, 22, 125—128).—Stimuli to the external secretion of the pancreas are not products of digestion, but are found preformed in the food. The consistency of the chyme and the rate at which it is emptied into the duodenum determine the potency of the pancreatic secretion. The secretion is not produced chemically, but probably reflexly from the duodenal mucosa. J. N. A.

Anatomy of the pancreatic duct. A. DERGUM (Dtsch. Arch. klin. Med., 1938, 181, 366—393).—The anatomical relation of the pancreatic to the common bile duct was studied in 25 cases. In 6 cases both ducts opened separately into the duodenal papilla; in 4 of the remaining 19 cases the length of the pancreatic and bile ducts after union was only 2—3 mm. The average length of muscle fibres of Oddi's sphincter was 9.1 mm. for the common bile duct and 5.8 mm. for the pancreatic duct. The entrance of bile into the pancreatic duct is difficult for anatomical reasons, even in pathological states. A. S.

Vomiting of pregnancy. J. M. MCGOWAN, J. O. BAKER, A. M. TORRIE, and J. LEES (J. Amer. Med. Assoc., 1938, 110, 498—500).—X-Ray studies of the duodenum in 2 patients suffering from the vomiting of pregnancy showed spasm of the second part of the duodenum. This was relieved by amyl nitrite. Nitroglycerin successfully controlled the vomiting in 12 cases. R. L. N.

Effect of duodenal stimulation in man on alimentary and adrenaline hyperglycaemia. H. SHAY, J. GERSON-COHEN, and S. S. FELS (Ann. intern. Med., 1938, 11, 1563—1589).—The duodenum was stimulated in 7 subjects (2 diabetics) by introduction of HCl and other substances through an Einhorn tube. With the tube in position, glucose was given by mouth and the amount absorbed after 30 min. determined by gastric lavage. Duodenal stimulation prevented the hyperglycaemia which would normally occur with the quantities of glucose absorbed (from the stomach), but had no effect on resting blood-sugar or adrenaline hyperglycaemia. It is suggested that duodenal stimulation increases islet activity. C. A. K.

Intestinal assimilation of lipins and absorption of calcium. L. BRULL and G. BARAC (Compt. rend. Soc. Biol., 1938, 127, 820—821).—In steatorrhea, the excess lipins are excreted as Ca soaps. H. G. R.

Influence of organic and inorganic acids on motility of the small intestine. N. M. GRAY (Amer. J. digest. Dis. Nutr., 1936, 2, 725—729).—In solutions of the same p_H (2.5) the motor-stimulating activity of acetic and lactic acid and HCl decreased

in the order named, differences being accentuated by eserine or choline. With rhythmic vagal stimulation 0.1M-acetic acid was little more effective than 0.04M-HCl as a motor stimulant. Eserine and choline enhanced the effect of acetic acid more than that of HCl. CH. ABS. (p)

Effects of drugs on motility of isolated segments of the human intestine. J. A. BARGEN and J. S. GUTHRIE (Amer. J. digest. Dis. Nutr., 1936, 2, 668—670).—Effects of pituitrin, eserine sulphate, cascara sagrada, and acetylcholine on the motility of various sections of the intestine are compared.

CH. ABS. (p)

Enterocrinin, a hormone which excites the glands of the small intestine. E. S. NASSET (Amer. J. Physiol., 1938, 121, 481—487).—An intestinal hormone, enterocrinin (intestinal secretagogue), was obtained from the small and large intestine of several species. The hormone is secretin-free; it does not excite the pancreas and augments the secretion of enzymes as well as fluid. A vasodilator-free enterocrinin has also been prepared.

M. W. G.

Intestinal length and body-weight in the adult albino mouse. S. LOEWE and T. W. LOEWE (Growth, 1937, 1, 201—203).—The lengths of small and large intestine remain const. after puberty although body-wt. ranges from 14 to 30 g.

W. F. F.

Influence of calcium and potassium on intestinal absorption. J. W. GARDNER and G. E. BURGET (Amer. J. Physiol., 1938, 121, 475—480).—KCl when added to a 10% glucose solution in concn. from 0.03% to 0.15% increases the rate of absorption of the solution from chronic closed intestinal loops in dogs. In similar concn. CaCl₂ decreases the rate of absorption below normal. Normal rats given 2 c.c. of a 50% glucose solution to which KCl was added absorbed more of the sugar than rats given the same quantity of glucose to which CaCl₂ was added.

M. W. G.

(I) LIVER AND BILE.

Liver and biliary tract: a review for 1937. C. H. GREENE, M. PLOTZ, and S. A. LOCALIO (Arch. Int. Med., 1938, 61, 655—690).

Combined water-galactose test of liver function. F. POLLAK (Klin. Woch., 1937, 16, 1251—1253).—Following the injection of 40 g. of galactose in 200 c.c. of water, a healthy subject excretes in the urine in the first 2 hr. period not more than 0.6%, and in a second period 0.1—0.2%.

F. W. L.

Liver function of the Chinese. W. W. CADBURY and T. Y. TING (Chinese Med. J., 1937, 52, 531—540).—In 117 patients one or more of the following four liver function tests were performed: direct and indirect Van den Bergh, icteric index, and bromosulphalein test. Of 64 with clinical diagnosis of liver disease 22% gave no evidence of abnormal function, whilst 30 of 53 patients with a non-hepatic diagnosis gave evidence of abnormal function. P. C. W.

Effects of intravenous injections of acacia on certain functions of the liver. W. K. HALL (Proc. Soc. Exp. Biol. Med., 1938, 38, 46—48).—Intravenous

injection of gum acacia in the dog in doses of 4.4—10.7 g. per kg. caused a diminished sugar tolerance to glucose and galactose, a fall in blood-protein, and prolongation of clotting time.

V. J. W.

Effect of certain arsenates on the liver. W. C. VON GLAHN, F. B. FLINN, and W. F. KEIM, jun. (Arch. Path., 1938, 25, 488—505).—Of 46 rabbits fed hay and oats and given a daily dose of Pb, Cu^{II}, or Na arsenate, only 4 (9%) failed to develop cirrhosis of the liver and of these 3 showed necroses in the liver. Pb arsenate was most effective. When carrots and cabbage were added to the diet, the incidence and severity of the cirrhosis were decreased and when fed on a rich carbohydrate diet of white bread and potatoes, only 2 of 26 rabbits showed a mild cirrhosis. There was no const. relationship between the amount of As present in the liver, the severity of the cirrhosis, and the survival time. The Pb or Cu in the arsenates did not cause the cirrhosis. The arsenates produced no liver changes in 51 rats and 15 ferrets.

C. J. C. B.

Respiratory quotient of diabetic liver. H. E. HIMWICH and J. F. FAZEKAS (Proc. Soc. Exp. Biol. Med., 1938, 38, 137—139).—Slices of liver from cats depancreatised 48—72 hr. previously had an average R.Q. of 0.59.

V. J. W.

Changes of intermediary carbohydrate and water metabolism in the liver in shock. I, II. S. TSUGE (Tôhoku J. exp. Med., 1938, 32, 531—557, 558—586).—I. Lactic acid, sugar, hæmoglobin, and protein content of the blood of the portal vein, hepatic artery, and hepatic vein were determined before and after anaphylactic shock produced by injection of horse serum into rabbits. Normally the lactic acid concns. in blood were: hepatic artery > portal vein > hepatic vein; sugar concns. in blood were hepatic vein > hepatic artery > portal vein; no difference in hæmoglobin concns. was found; the protein concns. were portal vein > hepatic artery > hepatic vein. In shock the lactic acid concns. were blood of hepatic vein > portal vein > hepatic artery; sugar content of hepatic vein blood was increased, in hepatic artery and in portal vein it remained unchanged. This is attributed to a rapid mobilisation of liver-glycogen. Hæmoglobin content of hepatic vein blood increased more than in hepatic artery and portal vein blood. The protein content was particularly increased in portal and hepatic vein blood.

II. The lactic acid content of carotid artery blood is temporarily diminished in histamine shock in rabbits and unchanged in peptone shock; it is increased in both conditions in portal and hepatic vein blood. The sugar and hæmoglobin content is increased in all 3 types of blood. Serum-protein is diminished in hepatic artery and portal vein blood and slightly increased in hepatic vein blood. A. S.

Changes of colloid-osmotic pressure in portal and hepatic vein blood in anaphylactic shock. S. TSUGE and Y. SANADE (Tôhoku J. exp. Med., 1938, 32, 587—599).—Serum-protein content and colloid-osmotic pressure are increased in anaphylactic shock of rabbits, especially in hepatic vein blood.

A. S.

Influence of adrenalectomy and choline on the fat content of regenerating liver during fasting. E. M. MACKEY and H. O. CARNE (Proc. Soc. Exp. Biol. Med., 1938, 38, 131—133).—Removal of 65% of the liver tissue of the rat causes fatty change at the end of 24 hr. in the liver remaining. This fatty change is decreased by adrenalectomy but not by choline. V. J. W.

Hepatotoxin. T. YOKOUTI (Tôhoku J. exp. Med., 1938, 32, 319—329).—Solutions of liver-cell protoplasm were repeatedly injected intravenously into ducks; their serum contains an antibody against liver cells, hepatotoxin, which produces degenerative change of the liver parenchyma, if injected intravenously into rabbits. A. S.

Detoxicating hormone of the liver (Yakriton). LXXXVIII. T. MINAGAWA (Tôhoku J. exp. Med., 1938, 32, 330—337).—Yakriton accelerates the elimination of intravenously injected Congo-red from the blood stream. A. S.

Detoxicating hormone of the liver (Yakriton). LXXXIX. S. SHIRAISHI (Tôhoku J. exp. Med., 1938, 32, 338—355).—Yakriton counteracts the fatal effects of the anaemia produced by subcutaneous injection of 0.015 g. of phenylhydrazine per kg. body-wt. A. S.

Experimentally induced jaundice. H. E. THOMSON and B. L. WYATT (Arch. Int. Med., 1938, 61, 481—500).—Administration of bile salt was without beneficial effect on the symptoms of chronic atrophic arthritis. Bilirubin administered alone had no beneficial effects but in combination with bile salts ameliorated the symptoms. T. H. H.

Effect of jaundice on chronic infectious arthritis and on primary fibrositis. P. S. HENCH (Arch. Int. Med., 1938, 61, 451—480).—Observations were made on the analgesic effect of jaundice on chronic infectious arthritis. The efficacy of the jaundice is directly proportional to the concn. of serum-bilirubin. The administration of bile salts, synthetic bile salts, diluted ox bile, human bile or liver extract, transfusions of highly jaundiced blood, and artificially produced jaundice were all tried in an attempt to reproduce the effect. T. H. H.

(m) KIDNEY AND URINE.

Histophysiological studies on the Malpighian tube of insects. II. Athrocytosis in the Malpighian tube of the Orthoptera. L. LISON (Arch. Biol., 1937, 48, 489—512).—With the dyes used it was not possible to demonstrate a definite gradient in the position of max. accumulation of the dye in the Malpighian tube of insects, such as occurs in vertebrates. The particle size of the dyes used varied only from 8.9 μ to 40 μ radius, and it is possible that with larger differences in particle size such a gradient might have been apparent. M. A. B.

Renal histophysiology in the Urodela. P. P. LAMBERT (Arch. Biol., 1936, 47, 125—179).—Study of the accumulation of dyes and proteins in the brush cells of renal tubules shows that particles of mol. wt. more than 68,000 and radius more than 24 μ will

not pass the glomerular barrier. Within the tubule, particle size determines the site of max. accumulation, which is at the top for the smallest particles and gradually approaches the basal end as particle size increases. M. A. B.

Degree of compensatory renal hypertrophy following unilateral nephrectomy. L. L. MACKEY, T. ADDIS, and E. M. MACKEY (J. Exp. Med., 1938, 67, 515—519).—Increased compensatory hypertrophy of the kidney following unilateral nephrectomy runs parallel with increased protein intake. Further increases of protein beyond the optimum have a diminishing effect on kidney hypertrophy, especially in young rats. A. C. F.

Innervation of the kidneys. L. MERKLEN, J. ROUX, and M. VIDACOVITCH (Compt. rend. Soc. Biol., 1938, 127, 305—308).—Intravenous injection of isotonic CaSO_4 solution increased the vol. of the innervated or denervated kidney. In the former case the urinary output is increased, in the latter it is diminished or suppressed. D. N.

Effect of magnesium deprivation on renal function. D. N. GREENBERG, S. P. LUCIA, and E. V. TUFTS (Amer. J. Physiol., 1938, 121, 424—430).—Prolonged deprivation of Mg produces pathologic changes in the kidney. Calcification occurs in the cortico-medullary zone, in the pyramids, and at a later stage in the cortex; there is an increase in vol. of urine; protein appears in the urine but not blood or casts. There is a progressive diminution in serum-protein, reaching levels at which oedema develops. M. W. G.

Influence of low pressure on kidney function. I. KOBAYASHI (Bull. Nav. Med. Ass. Japan, 1938, 27, 1).—Using the phenolsulphonaphthalein method on rabbits at atm. and low pressure, no difference was found during 2 hr. in the average vol. of urine excreted or in the % of colouring matter. M. H.

Relation between blood-chlorine and -urea and the histological picture of the renal function of the rat. P. FEYEL and R. VIEILLEFOSSE (Compt. rend. Soc. Biol., 1938, 127, 1072—1075).—Secretion and reabsorption of urea and Cl^- by the renal apparatus depends on the concn. of these substances in the blood. H. G. R.

Reaction of tubular epithelium of the frog's kidney to intraglomerular and interstitial injection of trypan-blue and hæmoglobin. H. KÖSTER (Beitr. path. Anat. allg. Path., 1937—1938, 100, 100—125).—Trypan-blue, injected into Bowman's capsule with a micro-pipette, is deposited as granules in the cells of the proximal convoluted tubules after 24 hr.; earlier there is only diffuse staining of the cells. Hæmoglobin, injected into Bowman's capsule, appears as fine droplets in the cells of the proximal convoluted tubules after 3 hr. and a little later in those of the ascending limb of Henle's loop and the distal convoluted tubules. Hæmoglobin, injected into the connective tissue between the proximal convoluted tubules, is deposited as after intraglomerular injection. In both instances a mass containing protein and hæmoglobin is found in the lumen of the tubules. It is concluded that hæmoglobin may be taken up

by the epithelial cells either from the lumen of the tubules (reabsorption) or by way of the basement membrane of the cells (secretion). H. W. K.

Formation and significance of hyaline droplets in the cells of the convoluted tubules of the kidney of *Salamandra maculosa*. A. HEIN (Virchow's Arch., 1938, 301, 339—356).—Cattle serum, normal human serum, and human serum from patients suffering from various kidney diseases, solutions of serum-albumin and -globulin and egg-albumin were injected into the coeliac cavity of *Salamandra maculosa*. The appearance of hyaline droplets in the cells of the convoluted tubules is due to the presence of the injected proteins in the lumen of the tubules. Proteins with a high mol. wt. were found only in the cells of nephrons which were in open connexion with the coeliac cavity; proteins with a relatively low mol. wt. were also found in the cells of closed nephrons. The quantity of droplets in the different parts of the tubules depended on the quantity and kind of the administered proteins and the duration of this administration. In closed nephrons, proteins with a mol. wt. of more than 70,000 can form hyaline droplets only when the permeability of the glomerular capillaries is altered. In the mammalian kidney, protein is perhaps excreted by the glomerulus and the hyaline droplets in the cells of the tubules may be due to reabsorption of protein (to conserve it in the body) and not to secretion. H. W. K.

Renal excretion of phenol-red by the aglomerular fishes, *Opsanus tau* and *Lophius piscatorius*. J. A. SHANNON (J. Cell. Comp. Physiol., 1938, 11, 315—323).—The tubules can transfer to the urine only a certain maximal quantity of phenol-red per unit of time whatever may be the concn. in the plasma. V. J. W.

Clinical and experimental studies on the occurrence of traumatic glycosuria. T. SATTO (Arch. klin. Chir., 1938, 191, 47—59).—The variations in renal sugar threshold, blood-sugar, and glycosuria in normal rabbits, rabbits with damaged liver or kidneys, and rabbits injected with atropine or ergotamine are reported after trauma (hitting on the head, fracture of long bones, and laparotomy). No anaesthetic is mentioned. I. H. A.

Method of obtaining neurotoxins from human urine. F. J. NIEUWENHUYZEN (Proc. K. Akad. Wetensch. Amsterdam, 1938, 41, 304—315).—A neurotoxin can be obtained from human urine (after addition of Na_2CO_3) by extraction with benzene. Injection into mice produced catalepsy and other nervous symptoms. C. A. K.

Neurotoxic symptoms, especially catatonia, produced in mice by substances from human urine. F. J. NIEUWENHUYZEN (Proc. K. Akad. Wetensch. Amsterdam, 1938, 41, 316—323).—Several chemical substances found in normal and pathological human urines were injected into mice and rats. The degree of toxicity (estimated by catatonia) was as follows: urea < creatinine < oxyproteic acid < indolyethylamine < dimethylguanidine < histamine < nicotine. C. A. K.

Detection of nutritional acidosis in ruminants by urine analysis. W. LENKEIT and M. BECKER (Landw. Versuchs-Stat., 1938, 129, 151—156).—The acid-base status in sheep during prolonged feeding of acid silage is followed by means of determinations of p_{H} and NH_3 and direct electrometric titration of the urine. Production of NH_3 varied considerably in different animals. A. G. P.

Mechanism of aqueous diuresis after ingestion of water. F. SCHMID (Compt. rend. Soc. Biol., 1938, 127, 430—432).—An extract of the small intestine with diuretic action has been prepared. The active material is heat-labile and loses its activity on exposure to air in the dry form. H. G. R.

Urea clearance in surgical renal affections. E. W. GØTHGEN (Acta chir. scand., 1938, 80, 26—40).—Abnormal urea clearance is less common in surgical than in medical affections of the kidneys. In normal individuals there may be a reserve urea clearance power three or four times the single clearance test figure. In bilateral renal disease, urea clearance is lowered only when the kidney affection is very extensive and the blood urea is markedly raised. 10 g. of urea, orally, in a normal subject, results in a rise of urea clearance after 6—24 hr., due probably to increase in the number of active glomeruli. The blood-urea rises but slightly. Following operations, urea clearance may rise considerably, although the blood-urea is normal. F. F. R.

Photometric determination of bilirubin in urine. L. JENDRASSIK and P. GRÓF (Biochem. Z., 1938, 296, 71—79; cf. A., 1937, III, 108).—The bilirubin content of 2 c.c. of urine is determined by pptg. the pigment with $\text{Na}_2\text{HPO}_4 + \text{CaCl}_2$, converting the ppt. into azobilirubin with NaNO_2 and sulphanilic acid, dissolving in conc. HCl, and measuring the depth of colour of the solution with a step-photometer. Healthy human urine contains only traces of bilirubin. In jaundice there is no relation between the bilirubin contents of serum and urine. W. McC.

Can bile acids be demonstrated in normal urine? W. WILKEN (Klin. Woch., 1937, 16, 1350—1351).—The H_2SO_4 fluorescence test is not sp. The absorption band of cholic acid at 3850 Å. was not observed in normal urine. F. W. L.

Metabolism of bacteria-free animals. V. Colorimetric determination of indole derivatives in urine. M. GROENWALL (Skand. Arch. Physiol., 1938, 78, 139—144).— HCl-FeCl_3 is added in equal amounts to two specimens of urine one of which is subsequently extracted with CHCl_3 . Both solutions are compared in a Pulfrich photometer. Indole derivatives, determined as indoxylsulphonic acid, are calc. as the extinction coeff. $\times 26$. A. S.

Absence of nicotinic acid from the urine of pellagrins. Its determination. S. P. VILTER, T. D. SPIES, and A. P. MATHEWS (J. Amer. Chem. Soc., 1938, 60, 731—732).—0.1—1 mg. of nicotinic acid or its amide is determined colorimetrically by treating 3 c.c. of decolorised urine first with 2:4-dinitrochlorobenzene and then with NaOH. Pyridine and nicotine, methylated betaine, and trigonelline give similar colours, which are due to

the *tert.* N. Normal urine gives this test, but not urine of pellagrins or of persons having sub-clinical pellagra or pellagra in relapse, and the test thus has diagnostic val. Ability to give the colour is restored, if absent, by feeding nicotinic acid. R. S. C.

Buffer action of unidentified urine constituents. A. C. KUYPER (J. Biol. Chem., 1938, 123, 409—420).—The total buffer action of urine, from which citrate, PO_4''' , and CO_3'' have been removed, can be determined from the slope of an electrometric titration curve. That part of the buffer action attributable to H^+ and OH^- and to known acidic and basic constituents can be calc. from dissociation and analytical data, and the remaining buffer action is due to the undetermined constituents. From pH 5 to 8 amino-acids and other constituents exert slight buffer action, but beyond these limits their effect is more pronounced. Addition of acid or alkali to the diet causes little redistribution of the unidentified buffering substances. Contrary to previous statements Na citrate, alone or mixed with citric acid, does not cause excretion of significant amounts of unidentified org. acid. C. R. H.

Quantitative collection of urine from small children. E. E. HAWLEY (J. Pediat., 1938, 12, 381—385).—A satisfactory method is described fully with diagrams. C. J. C. B.

Normal Addis sediment count in children. A. W. SNOKE (J. Pediat., 1938, 12, 473—478).—Addis sediment counts were carried out in 202 presumably normal children. The no. of casts and red blood cells excreted in 12 hr. were 0—9000 and 0—600,000 respectively. The protein excreted in 12 hr. varied from 5 to 70 mg. The upper limit of normal protein excretion is probably 55 mg. C. J. C. B.

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

Consequences of sigmoid growth for relative growth functions. H. LUMER (Growth, 1937, 1, 140—154).—It is shown mathematically that Huxley's parabolic growth law is the first approximation of sigmoid growth laws of the following types: (a) simple autocatalytic, (b) generalised autocatalytic, and (c) Gompertz function. Huxley's data and other data (some previously unpublished) are fitted to the new formulations. W. F. F.

What is a growth cycle? S. A. COURTIS (Growth, 1937, 1, 155—174).—A review of definitions and of data in illustration. W. F. F.

Physiological studies of poultry. I. Body measurements of male and female Los Baños Cantonese fowls. F. M. FRONDA and A. S. MARCELO (Philippine Agric., 1937, 26, 561—567).—Data for birds of different ages are recorded and discussed. A. G. P.

Inorganic skeletal substance. Its composition and its natural and synthetic formation. R. KLEMENT (Naturwiss., 1938, 26, 145—152).—The chief constituent of bones and teeth of various animals is a "hydroxyapatite," $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$, accompanied by CO_3'' , Mg , Na , K , and F . The F is

more abundant in sea than in land animals and its presence in the bone is probably adventitious as it replaces the OH groups in "hydroxyapatite" without change of crystal structure. The 2—6% of CO_3'' is present mainly as CaCO_3 , and partly as Na_2CO_3 and K_2CO_3 . Model experiments *in vitro* are described illustrating the formation of calcareous deposits at 37° and 17° corresponding in composition with that of the bones of warm- and cold-blooded animals respectively. The mechanism of the deposition of the Ca and other salts in bone formation is discussed.

W. O. K.

Fluorine storage in cattle bones. R. J. EVANS, P. H. PHILLIPS, and E. B. HART (J. Dairy Sci., 1938, 21, 81—84).—Small amounts of F are transferred in the cow through the placenta into the fetus. The bones of calves fed solely on milk contain a const. low quantity of F obtained through the milk. Storage of F occurs in the bones after weaning. F is present in appreciable amounts in the org. matrix of bone and in cartilage. W. L. D.

Time of determination of hair pigments in the mouse. S. C. REED and G. SANDER (Growth, 1937, 1, 194—200).—Pieces of embryonic skin are grafted on to newborn mice, ventral skin being grafted dorsally and vice versa. The determination of hair pigmentation pattern of the gene mutation black-and-tan occurs at a very early stage in the development of the epidermis, when it consists of 3—4 layers of cells and its Malpighian layer is a single row of identical cells. Descendants of these cells form the hair follicles within which appear the pigment granules (black on the dorsal surface of the animal and tan on the ventral).

W. F. F.

Polariscopic study of the structure of tooth enamel. M. HARDERS-STEINHÄUSER (Kolloid-Z., 1938, 83, 86—98).—A general account is given of the application of optical polarisation methods to the study of enamel. [B.] F. L. U.

Occurrence of small amounts of iodine and fluorine in the organism. III. A. MAYRHOFER (Biochem. Z., 1938, 295, 302—314; cf. A., 1932, 1181; 1936, 1038).—The I and F contents of plants, soils, water, beer, and wine have been determined by modifications of the methods previously described.

W. McC.

Colorimetric method for investigating the sweat glands. L. GUTTMANN (Klin. Woch., 1937, 16, 1212—1213).—A powder consisting of Na quini-zarin-2:6-disulphonate, Na_2CO_3 , and rice starch is employed; sweating is induced by dry heat.

F. W. L.

Determination of alcohol in saliva. R. FABRE and E. KAHANE (Compt. rend. XVII Cong. Chim. Ind., 1937, 1—8).—The saliva of persons who have consumed no alcohol for 48 hr. contains only traces of alcohol. After consumption of alcohol, the alcohol content of the saliva increases greatly, the ratio salivary alcohol: blood-alcohol being almost always slightly above 1. Alcohol disappears from the saliva at the same rate as from blood. The alcohol content of the saliva of persons who have consumed alcohol is not affected by smoking but previous smoking tends to preserve unchanged *in vitro* the otherwise decreasing

alcohol content of the decomposing saliva. Samples of saliva to be tested for alcohol must be taken more than 25 min. after consumption of alcohol.

W. McC.

Substances with a blue fluorescence. Variation in the colour of the fluorescence as a function of p_H . A. GOURÉVITCH (Compt. rend. Soc. Biol., 1938, 127, 1061—1063).—On acidification of the fluorescent material from carp's eyes, the fluorescence becomes more violet and disappears when strongly acid, whilst it becomes green on addition of small or large amounts of alkali. The fluorescence is destroyed on oxidation and has been observed in extracts of the eyes of crustaceans.

H. G. R.

Physiology of contractile vacuoles. III. Water balance of fresh-water peritricha. J. A. KITCHING (J. exp. Biol., 1938, 15, 143—151).—The rate of output of fluid from the contractile vacuoles of fresh-water peritrich ciliates was reduced in sulphide solutions of concn. not less than 0.001M. This effect was reversible. CN' depressed the rate of vacuolar output in a concn. of 10^{-5} M, but was more effective in higher concns. (0.001M); the body swelled. Return of the organism from CN' solution to tap water was followed by a sharp increase in the rate of vacuolar output to an abnormally high val. The body then shrank gradually to its normal size, and the rate of output also fell slowly to normal. The swelling of the body produced by CN' was prevented by the addition of sucrose (0.05M concn.) to the outside medium. It is concluded that the normal difference of osmotic pressure across the body surface is equiv. to that of a 0.05M-sucrose solution, and that this difference is maintained by the contractile vacuole.

J. M. R.

Colour changes in lizards, particularly in *Phrynosoma*. G. H. PARKER (J. exp. Biol., 1938, 15, 48—73).—The blanching of *P. blainvillii* is due to (1) the action of nerve-fibres on the melanophores, (2) the action of a humoral agent, probably adrenaline, on the cells, (3) the direct response of the cells to darkness, and (4) high temp. The blanching of *Chamaeleo* is due to (1), (2), and (4). The darkening of *Phrynosoma* is due to (5) the action of a pituitary agent on its melanophores, (6) the direct response of these cells to strong light, and usually (7) to low temp. There are no dispersing nerve-fibres in *Phrynosoma*. The darkening of *Chamaeleo* is due to (6) and (7). This lizard probably possesses dispersing nerve fibres.

J. M. R.

Chemistry of lipoidosis phosphatidica. P. H. TEUNISSEN and A. DEN OUDEN (Z. physiol. Chem., 1938, 252, 271—274).—The method of Epstein and Lorenz (A., 1930, 1208; 1931, 115) permits separation of lecithins and sphingomyelins when the content of these is high, but not in normal organs which contain chiefly glycerophosphatides. Earlier views (A., 1937, III, 379) are modified. In the Niemann-Pick disease, accumulated phosphatide in liver and spleen is sphingomyelin; the lecithin content may increase somewhat as a secondary effect.

J. D. R.

Lipins of sheep skins. I. Lipins of fresh sheep skin. R. M. KOPPENHOEFER (J. Amer. Leather Chem. Assoc., 1938, 33, 203—215).—

Detailed analyses of the lipins from the epidermal division, corium, subcutaneous tissue, and wool of a 1—2 year old male, coarse-wooled, fresh sheep skin of mixed breed are recorded. The epidermal layer has been separated into wax, kephalin, lecithin, and acetone-sol. fractions, the corium and subcutaneous tissue lipins into triglyceride, phospholipins, and acetone-alcohol-sol. fractions. Larger quantities of lipins are present in sheep skin than in goat skin or steer hide. Epidermal lipins are composed principally of waxes and cholesterol, whilst corium and subcutaneous tissue lipins are mainly triglyceride. The wax present is more unsaturated than that of other skins. 75% of total wool lipins is composed of waxes.

D. P.

Transformation of collagen into collagen II and gelatin.—See A., 1938, II, 209.

Fat of green turtle. T. G. GREEN and T. P. HILDITCH (Biochem. J., 1938, 32, 681—686).—The fatty acids of *Chelone mydas*, L., are similar in type and distribution to those in depot fats of other amphibia, but in addition to palmitic acid there are nearly as much lauric and myristic acids. The total saturated acids comprise 50% of the total fatty acids. Oleic acid is the main unsaturated acid, but unsaturated C_{16} , C_{20} , and C_{22} acids are also present. The glycerides are a complex mixture in which the acids, including lauric acid, are fairly evenly distributed. The fat includes nearly 10% of saturated glycerides (mainly mixed lauro-myristo-palmitins) and about the same amount of tri- C_{18} glycerides. Most of the glycerides contain at least one oleic acid group.

J. N. A.

Docosaehaenoic acid in cod-liver oil.—See A., 1938, II, 216.

Distribution of α - and β -lecithin and of kephalin in the organs of rabbits and dogs. T. YOSHINAGA (J. Biochem. Japan, 1938, 27, 81—90).—Data for the contents of lung, liver, heart, kidney, brain, muscle, stomach, and small and large intestine are tabulated.

F. O. H.

Preparation of dopa-melanin. L. E. ARNOW (Science, 1938, 87, 308).—50 c.c. of 0.01N-NaOH are saturated with dihydroxyphenylalanine (dopa), and air, saturated with H_2O , is passed through the solution until it turns black. After 2 days, the solution is acidified by the addition of 2 c.c. of 0.5N-HCl, and the insol. melanin centrifuged and washed with 0.005N-HCl. The melanin is suspended in H_2O , HCl is removed by evaporation to dryness, and the residue dried over P_2O_5 .

L. S. T.

Physiology of melanotic pigments of skin in man. R. LATARJET (Biol. méd., 1938, 28, 65—104).—A review.

W. D'A. M.

Localisation and rôle of flavin or of a related substance in fish skin. M. FONTAINE and R. G. BUSNEL (Compt. rend., 1938, 206, 372—374).—The high flavin content of eel skin, together with histological localisation of this pigment in the melanophores, has been confirmed in other non-sealy fish (muræna, conger, and blenny). In sealy fish such as carp, no flavin, but a closely allied substance, insol. in $CHCl_3$, with a blue fluorescence, has been found associated with the melanophores. The relation of

this substance to the physiology of the melanophores is discussed. T. F. D.

Flavin content of human milk. W. NEUWEILER (Klin. Woch., 1937, 16, 1348—1350).—In human milk it is 16—52 $\mu\text{g.}\%$; in cows' milk it is 100—150 $\mu\text{g.}$ and varies with the diet. F. W. L.

Production of alkaline milk and increase in the iodine value of butter fat after the subcutaneous injection of α -dinitrophenol. E. BROUWER and J. MARTIN (Lait, 1938, 18, 337—347).—After injection of regular doses to goats, the p_{H} of the milk rose from 6.6 to 7.5, the I val. of the butter fat rose from 29 to 41 and the CO_2 content (NaHCO_3) rose from 5 to 100 vols. $\%$. The recovery after 5 injections in 2 days took 6—7 days. The digestible N intake was lower immediately following the injections. The milk was coloured yellow by the unchanged phenol. W. L. D.

Relation between lactose and ash content of milk of different mammals. P. F. SHARP (J. Dairy Sci., 1938, 21, 127—128).—An inverse relationship exists between lactose and ash contents which is also the case when ash per 100 g. water is plotted against lactose on the same basis. In different mammals the water of milk ranges from 65 to 88%, ash from 0.23 to 2.5%, and lactose from 2.0 to 6.7%. W. L. D.

Change in sodium content of milk of certain mammals during lactation period. M. VUK and Z. VON SÁNDOR (Z. Unters. Lebensm., 1938, 75, 312—316).—Cow's, sheep's, goat's, and human milk contained 0.281—0.308 (mean 0.296), 0.347—0.435 (0.398), 0.241—0.277 (0.256), and 0.0022—0.085 (0.0352) g. of Na per l., respectively. In each case the [Na] falls irregularly from parturition throughout the period of lactation. Adulteration of human milk with that of other animals is readily detected by means of the increased [Na]. E. C. S.

Reactions of the dairy cow to changes in environmental temperature. W. M. REGAN and G. A. RICHARDSON (J. Dairy Sci., 1938, 21, 73—79).—Cows were kept at temp. of 5° to 39° at R.H. 60% and air movement of 60 cu. ft. per min. As temp. increased, the respiratory rate increased, doubling for every 10° rise; pulse rate decreased. At 27—30° heat balance could not be maintained. Higher temps. caused anorexia, decrease in yield of solids, milk, and an increase in the fat content. The p_{H} of the milk was raised, Δ lowered, and rennet coagulation time prolonged. The butter fat was lower in volatile acids and higher in I val. W. L. D.

Symposium on cancer (University of Wisconsin Press, Madison, U.S.A., 1938, x + 202 pp.).—A series of papers given in 1936 at Wisconsin and published without bibliography. L. KREYBERG describes (I) two strains of mice with widely differing tumour incidence on application of a tar of low carcinogenic activity, and (II) the increase in tumour incidence in tarred mice on feeding liver, butter, or dried thyroid. C. C. LITTLE: the influence of foetal circulation and milk on the incidence of mammary cancer in mice. M. T. MACKLIN: the incidence of cancer in man. E. ALLEN, G. M. SMITH, W. V. GARDNER, L. C.

N N (A., III.)

STRONG, and W. O. NELSON: effect of ovarian hormones on the development of malignant tumours. H. B. ANDERVONT: (I) chemistry of carcinogenic substances and (II) effect of bacterial products in producing hæmorrhage and inhibition of growth of animal tumours. J. EWING: (I) cancer as a problem of public health, and (II) the use of biopsy in diagnosis. Radiology is discussed from the experimental side by G. FAILLA and from the clinical aspect in two papers by H. COUTARD and one by E. NOVAK. Other reviews are on tissue culture of cancer cells (W. H. LEWIS); the biology of the cancer cell (S. P. REIMANN); and the relation of viruses to cancer (J. B. MURPHY). E. B.

Carcinogenics and growth stimulation. S. E. OWEN, H. A. WEISS, and L. H. PRINCE (Science, 1938, 87, 261—262).—In *Euplania dorotocephala*, 1:2:5:6-dibenzanthracene stimulates both regeneration of cut segments and reproduction of whole animals. Triphenylbenzene stimulates the whole animal but has no action on segments. Glutathione acts like dibenzanthracene but its derivatives, glutamic acid, glycine, and cysteine, are ineffective. Allantoin and larval extract were also without action. C. A. K.

Secondary colony development in bacteria and an analogy with tumour production in higher forms. A. HADDOW (Acta internat. Union Cancer, 1937, 2, 376—401).—Secondary colony formation in bacteria and tumour formation in mammals are compared as examples of irreversible dedifferentiation. E. B.

Bio-electric properties of cancer-resistant and cancer-susceptible mice. H. S. BURR, G. M. SMITH, and L. C. STRONG (Amer. J. Cancer, 1938, 32, 240—248).—The p.d. between various points on the skin of mice was measured, and significant changes in the potential across the chest were found at the time of development of mammary cancer. In some cases the voltage rise (several mv.) appeared about 2 weeks before the observation of tumours. The chest potentials return to normal in 2—4 weeks. E. B.

Are ultra-violet rays necessary for the production of tar carcinoma? O. TEUTSCHLAENDER (Klin. Woch., 1937, 16, 1284—1285).—Tar carcinoma in mice can be produced in the absence of ultra-violet radiation. F. W. L.

Effect of oil of wintergreen on spontaneous tumours of the mammary gland in mice. L. C. STRONG (Amer. J. Cancer, 1938, 32, 227—239).—Natural oil of wintergreen was fractionated into low- and high-boiling portions and the main fraction, methyl salicylate. The first two were fed to mice of strong A strain bearing mammary tumours. The high-boiling fraction had no effect on the growth rate of tumours or on the survival times of the animals. The low-boiling fraction caused slowing of the growth rate of tumours, with complete regression in 4 out of 34 mice, increased survival time, and histological changes in the tumours. The effects were rather more marked on young than on old mice, and on the smaller tumours. Only average growth-rate curves are given. E. B.

Effect of heteroplastic transplantation on the metabolism of experimental cancer. C. SELLEI (Biochem. Z., 1938, 296, 80—82).—The increase in malignancy of the Ehrlich mouse carcinoma resulting from transplantation into rats is associated with increased metabolism and, especially, increased glycolysis. When the tumour is retransplanted into mice aerobic and anaerobic glycolysis decrease. The R.Q. is then greater than before transplantation but the quotient of glycolysis is approx. the same. The body fluids of the rat have a more powerful catalytic effect on the respiration and glycolysis of the tumour than have those of the mouse and the tumour develops more rapidly in the rat. W. McC.

Possible rôle of urea in the formation of cancerous growths. J. C. M. GARDNER (Nature, 1938, 141, 692).—It is suggested that urea may be a factor in the formation of cancerous growths in the human body. L. S. T.

Effect of carcinogenic agents on tissue cultures. G. MAUER (Arch. exp. Zellforsch., 1938, 21, 191—211).—Certain carcinogenic hydrocarbons (benzpyrene, benzantracene, dibenzanthracene, methylcholanthrene) were added to cultures of fibroblasts taken from the 14-day dog embryo. Changes observed included vacuolation, fatty degeneration and anisomorphosis and nuclear fragmentation, coagulation of chromatin, and hypochromatism. The relation of these changes to the findings in malignant cells is discussed. R. J. O'C.

Effect of theelin on transplantable mammary rat adenofibroma. L. A. EMGE, K. M. MURPHY, and W. SCHILLING (Proc. Soc. Exp. Biol. Med., 1938, 38, 21—23).—No effects were produced on the growth of the tumour as compared with controls. V. J. W.

Induction of tumours by 3:4:5:6-dibenzcarbazole in male mice of the CBA strain, which develops spontaneous hepatoma. L. C. STRONG, G. M. SMITH, and W. V. GARDNER (Yale J. biol. med., 1938, 10, 335—345).—Painting a 0.1% solution on the skin induced epithelioma of cutaneous tissues, carcino-sarcoma of the subcutaneous tissues, sarcoma, low-grade inflammation of the liver, and hyperplasia of the biliary ducts. Injection of 1.2 mg. dissolved in sesame oil (in 6 divided doses) induced sarcoma at the site of the injection in all of CBA and A mice. A low-grade inflammation of equal severity was produced in the livers of both strains. Bile-duct hyperplasia rarely occurred in the CBA strain. Benign circumscribed hepatoma occurred in all of eight CBA mice receiving injections; the age incidence of these tumours was earlier than those previously described occurring normally. No hepatomas occurred in A mice. A. G. M. W.

Effect of 1:2:5:6-dibenzanthracene on spindle cell sarcoma of a rat. F. A. McJUNKIN and W. WOLAVKA (Arch. Path., 1938, 25, 506—513).—A spindle cell sarcoma that did not regress spontaneously in the normal rat can be made to disappear by intraperitoneal but not by intratumoral injections of aq. emulsions of 1:2:5:6-dibenzanthracene and lecithin. It is suggested that the rapid introduction

of carcinogenic substances into the blood and tissues causes an enormous general production of factors which slow growth. C. J. C. B.

Influence of calories *per se* on the growth of sarcoma 180. F. BISCHOFF and M. L. LONG (Amer. J. Cancer, 1938, 32, 418—421).—Mice were fed on a diet of calf meal with or without added starch or fat. Tumour growth was retarded when the calorie intake was low, but was normal when a restricted calf-meal diet was supplemented with starch or fat. Tumour growth on starch + casein was greater than on starch alone. E. B.

Tumour growth in mice one-fifth saturated with deuterium oxide. H. G. BARBOUR and E. ALLEN (Amer. J. Cancer, 1938, 32, 440—446).—Mice with and without transplanted tumours received water containing 40% of D₂O. The tumours of controls drinking ordinary water grew faster and the mice lived longer. E. B.

Agent and soil in experimental carcinogenesis. W. H. WOGLOM (Amer. J. Cancer, 1938, 32, 447—448).—Threads soaked in a benzene solution of 3:4-benzpyrene were introduced into various organs of the rat and into the subcutaneous tissue. Neoplasms were produced only in the latter sites and not in the kidney, testis, liver, or uterus. E. B.

Intravenous administration of colloidal solutions of carcinogenic hydrocarbons in rabbits. G. V. LE ROY, E. V. KANDEL, and A. BRUNSCHWIG (Amer. J. Cancer, 1938, 32, 449—452).—Intravenous injection of colloidal solutions of 1:2:5:6-dibenzanthracene, 3:4-benzpyrene, and methylcholanthrene into rabbits produced no tumours. 31 out of 53 rabbits survived from 26 to 81 weeks and received 10—30 mg. of the carcinogenic agent. E. B.

Neoplasia in rabbits following the administration of 1:2:5:6-dibenzanthracene. H. BURROWS and E. BOYLAND (Amer. J. Cancer, 1938, 32, 367—382).—Application of 1:2:5:6-dibenzanthracene to the vaginal vault, mammary ducts, or subcutaneous tissues of rabbits produced no tumours at the sites of application, but 8 out of 16 rabbits submitted to prolonged dosage which survived 900 days developed uterine tumours. E. B.

Intranucleolar bodies in normal and neoplastic human tissue. R. C. PAGE, J. F. REGAN, and W. C. MACCARTY (Amer. J. Cancer, 1938, 32, 383—394).—Two types of intranucleolar bodies can be observed in fresh frozen sections of normal tissues and of benign and malignant tumours. "Refractive bodies" are unstained by polychrome methylene-blue; they are more frequent and larger in benign and malignant tumours than in normal cells. "Argentophile bodies" are also more numerous in tumours than in normal tissue. E. B.

Some chemical constituents and biochemical reactions of tumours. E. BOYLAND (Acta Internat. Union Cancer, 1938, 3, 3—12).—A crit review. E. B.

Production of lymphomatosis in mice of known genetic constitution. J. J. MORTON and G. B. MIDER (Science, 1938, 87, 327—328).—48 mice

(Little's dilute brown strain) were painted when 4–6 weeks old with 0.5% methylcholanthrene in commercial benzene. The site of application was changed with each painting. 10 mice developed lymphomatosis with a leukæmic blood picture. In controls, leukæmia was rare and never occurred before the animals were 18 months old. C. A. K.

Prague sero reactions for cancer. F. BERGH, O. M. HENRIQUES, and J. SCHONSBOE (Nature, 1938, 141, 751).—There was a high proportion of positive responses of the Waldschmidt-Leitz sero reaction in cases of cancer. Patients without cancer gave mainly negative responses. C. A. K.

Glycolysis in tumour tissue. II. Effect of certain sugars on the p_H and lactic acid content of Walker carcinoma 319. F. F. BECK, R. MUSSER, C. J. CARR, and J. C. KRANTZ (Amer. J. Cancer, 1938, 32, 434–439).—The p_H of rat muscle and of Walker carcinoma 319 were measured *in vivo* with a glass electrode. Intraperitoneal injection of 0.6 g. of glucose, dihydroxyacetone, and hydroxypyruvaldehyde in solution caused decreases in p_H in tumours. Glucose produced no change in muscle but the other compounds caused a similar decrease. All 3 compounds caused an increase of lactic acid in tumours and muscle; glucose produced most lactic acid in tumours and dihydroxyacetone in muscle. E. B.

Action of carcinogenic agents on the metabolism of glucose by surviving tissues or living yeast. Y. POURBAIX (Acta internat. Union Cancer, 1938, 3, 31–68).—The author's work (1932–1938) is summarised. E. B.

Arginase activity of tumours. I. Rabbit and fowl sarcoma. M. KAJI (J. Biochem. Japan, 1938, 27, 35–43).—Maceration juice from sarcoma tissue (rabbit) exhibits arginase activity which is much less than that of the juice of rabbit's liver or fowl's kidney. The activity is independent of the period or site of implantation of the tumour and of the degree of necrosis. With fowl sarcoma, the activity of acetone-dried preps. from extracts is equal to, or even greater than, that of preps. from fowl's liver. The arginase activity of sarcoma-tissue preps. is increased by addition of $MnSO_4$ (optimum concn. $2.5\text{--}5.0 \times 10^{-4}M$). F. O. H.

Agglutination tests in the study of tumour immunity, natural and acquired. T. LUMSDEN (Amer. J. Cancer, 1938, 32, 395–417).—All rats immunised against homologous normal (e.g., spleen) or malignant cells develop isoagglutinins and hemotoxic chromatolysins in their sera, the titres of which increase together. Red blood cells evoke isoagglutinins but not chromatolysins. The sera of rats in which Jensen sarcomata regress or fail to grow always contain isoagglutinins and chromatolysins at some period. E. B.

Immunisation against neoplasm. Its effect on the nitrogen metabolism of the host. R. H. OSTER and W. T. SALTER (Amer. J. Cancer, 1938, 32, 422–433).—The apparent fasting blood-urea of normal and tumour-bearing mice is unaffected by X-radiation. Immune animals have initially the

normal blood-urea concn. (about 30 mg.-%) which decreases to about 20 mg.-% in a few days and then returns slowly to normal. E. B.

(o) NUTRITION AND VITAMINS.

Dietary principles in ancient Chinese medicine. H. C. HOU (Chinese Med. J., 1938, 53, 347–352).

P. C. W.

Influence of diet on the biochemistry and biology of the fully developed insect, *Leptinotarsa decemlineata*, Say. Action of *Solanum demissum*, Dun., and its hybrids. R. G. BUSNEL (Compt. rend., 1938, 206, 694–696).—Insects fed on *S. demissum* and some of its hybrids store less lipins and reducing substances, are less in wt. and slower in hibernating, have a higher mortality rate, and are in poorer condition than those fed on *S. tuberosum*. J. L. D.

Method of diet analysis. Application in research and pediatric practice. B. S. BURKE and H. C. STUART (J. Pediat., 1938, 12, 493–503).—Charts for obtaining complete dietary histories in children are given; the diets of 10 two-year-old children with highest and 10 with lowest hæmoglobin levels observed at a welfare centre are analysed. The dietary Fe rating was poor in 8 out of the 10 with low hæmoglobin; it was poor in only one doubtful case in the high-hæmoglobin group.

C. J. C. B.

Nutritional influence on teeth. F. KRASNOW (Amer. J. Publ. Health, 1938, 28, 325–333).—Data are given to prove that a balanced diet has a positive influence on dental structure and health. The importance of salivary analyses as an additional guide to changes of diet is discussed. W. L. D.

Prevention by egg-yolk of chick dermatitis due to egg-white. J. G. LEASE (Poultry Sci., 1937, 16, 374–377).—Pellagra-like symptoms in chicks caused by feeding egg-white with a grain ration require for prevention 5–10 times as much yolk as white (dry wt.) in the ration. Rats were protected by a yolk : white ratio of 2 : 1. A. G. P.

Transmission of xanthophylls in feeds to the yolk of the hen's egg. V. HEIMANN and L. A. WILHELM (Poultry Sci., 1937, 16, 400–403).—Increments in xanthophyll contents of hen rations produced progressively smaller increments in yolk colour. Effects of various sources of xanthophylls are compared. The increase in yolk colour follows rapidly on the increase in dietary xanthophyll but the reverse process is more gradual. A. G. P.

Infections observed in experimental animals fed on certain unbalanced diets. H. C. HOU (Chinese Med. J., 1938, 53, 47–52).—Batches of 15–25 rats were fed on 8 different unbalanced diets and at death the no. of "spontaneous" infections in each group was recorded. Vitamin-A deficiency increased the incidence of infection, which was further raised by a high -D intake. -A-deficient diets with high casein and low starch intake induced a specially high incidence of skin infections. Substitution of animal by vegetable protein protected the genital tract from infection. P. C. W.

Artificial feeding of infants. W. TOBLER (Schweiz. med. Wschr., 1938, 68, 285—287, 310—312).—A review.

Value of irradiated milk in infant feeding. W. H. CLARK (Arch. Pediat., 1938, 55, 178—184).—Favourable results in a group of 46 children are described. C. J. C. B.

Milk and nutrition. II. Effects of dietary supplements of pasteurised and raw milk on growth and health of school children. MILK NUTRITION COMM. (Rept. Nat. Inst. Res. in Dairying, 1938, 34 pp.; cf. B., 1937, 609).—3300 boys and 2800 girls (5—14 years of age) in 5 different areas were divided into 4 feeding groups receiving (a) biscuit (75 cal.), (b) $\frac{1}{2}$ and (c) $\frac{2}{3}$ pint of pasteurised, and (d) $\frac{2}{3}$ pint of raw milk daily respectively. Gains in height and wt. were measured for 12 months. Group d gained 4—6% more in height and 9—10% more in wt. than group a. In each of the 3 age groups (5—7, 8—10, 11—14 years), children on diet b gained more in wt. and height than a, and those on c more than on b, the gains being more persistent in wt. The children were classified into 3 groups according to clinical nutritive condition. Children on milk supplement in each clinical group showed superior rates of growth to those on biscuit, abs. gains being greater in the group initially defined as well nourished. No consistent difference in the increments due to feeding $\frac{2}{3}$ pint of raw instead of pasteurised milk was apparent. W. L. D.

Nutritional significance of curd tension of milk. ANON. (Milk Plant Month., 1937, 26, No. 12, 54—56).—The variation of the curd tension of milk from individual cows is discussed and methods of lowering curd tension are enumerated. Milk products which yield soft curd as a result of the methods of manufacture are more rapidly digestible and the time for the curds to remain in the stomach is less than with hard-curd products. There is no evidence of better utilisation of soft curd. W. L. D.

Rôle of protein in human nutrition. R. JACQUOT (Bull. Soc. Sci. Hyg. Aliment., 1938, 26, 17—38).—Metabolism of N, the experimental evaluation of N requirements, and the application of results to the selection of diets are discussed. A. G. P.

Specific dynamic action of first-class protein following a long fast. B. CERA and C. LOMBROSO (Biochem. Z., 1938, 296, 28—34).—In dogs the sp. dynamic action of meat given after a fast of 6—7 days is below normal. W. McC.

Effect of high-protein feeding on milch cows. P. A. SESHAN (Indian J. Vet. Sci., 1937, 1, 289—298).—Two groups of 6 cows each were fed with production rations containing 21 and 29% of digestible crude protein. The two groups did not differ in food consumption, milk yield, or body wt. but the milk of the high-protein group was richer in ash, Ca, and non-protein-N. W. L. D.

Utilisation of protein by growing cattle. S. TIMARIU (Landw. Versuchs-Stat., 1938, 129, 124—150).—Of the crude protein of hay 39.1% and of earth-nut meal 72.9% was utilised in flesh formation.

57% of the digested N from hay and 74.6% of that of earth-nut meal were utilised. Differences depend on the much slower rate of digestion of hay protein, which is largely contained in lignified cells, and the resulting proportional increase in the amount of amino-acid destroyed by the digestive bacteria. Animal protein (blood meal) and vegetable protein (leguminous seeds) were equally effective in flesh production. A. G. P.

Metabolism trials with "amide slices." W. WÖHLBIER and C. WINDHEUSER (Landw. Versuchs-Stat., 1938, 129, 102—109).—Partial replacement of the protein of a sheep ration, substantially free from amides, by "amide slices" (urea-potato) resulted in increased urinary urea and a negative N balance. Probably $\frac{1}{4}$ — $\frac{1}{2}$ of the ingested urea exerts a "protein-sparing" action. A. G. P.

d-Lysine and growth. F. S. HAMMETT (Growth, 1937, 1, 111—118).—Equal nos. of the marine hydroid *Obelia geniculata* were used as test and control animals. The two groups were grown under identical conditions of p_H , temp., and illumination. 50,000 animals were used over three different seasons. No evidence was found that the growth is dependent on d-lysine. W. F. F.

Developmental growth and nucleic acid components. V. Cytosine. F. S. HAMMETT, T. F. LAVINE, and M. LAVINE (Growth, 1937, 1, 189—193).—*Obelia geniculata* was used; cytosine from sheep thymus was added to the culture medium to give concns. from M/400,000 to M/6250. It influences the differentiation stage of developmental growth. W. F. F.

Calcium. G. M. WISHART (Brit. Dent. J., 1938, 64, 129—141).—A review, with special reference to the aetiology of dental caries. A. MacG.

Determination of the calcium requirement of man. M. A. HYE (Indian J. Vet. Sci., 1937, 7, 303—304).—By measuring average intakes and outputs of Ca at different levels of feeding and plotting the results, a straight line is given on which outputs and intakes are equal at 0.52 g. per day. W. L. D.

Calcium deficiency syndrome produced in growing animals. G. J. MARTIN (Growth, 1937, 1, 175—181).—Young puppies fed on a diet containing 30 parts in 10⁶ of Ca maintain the serum-Ca level within normal limits during the entire course of the deficiency. Typical tetanic convulsions were observed and ultimately death. W. F. F.

Calcium and phosphorus deficiency in a poor human dietary. W. E. GAUNT, J. T. IRVING, and W. THOMSON (Brit. Med. J., 1938, I, 770—773).—Rats bred from stock were fed on a poor human diet. Addition of salts of Ca and P increased the nutritional val. of the diet as much as the addition of milk and green food supplements. C. A. K.

Nature of magnesium tetany. M. GREENBERG and E. V. TUFTS (Amer. J. Physiol., 1938, 121, 416—423).—The symptoms of vasodilatation and hyperirritability in Mg-deficient rats were found to be greatly affected by the degree of Mg deficiency, the dietary levels of Ca and vitamin-B₂, and the age of the rats. The location of the lesion concerned

with the hyperirritability appears to be in the mid-brain or pons. Curare does not prevent the onset of convulsive seizures in Mg tetany. M. W. G.

Changes in the water of tissues induced by diets containing various mineral supplements. E. S. EPPRIGHT and A. H. SMITH (Amer. J. Physiol., 1938, 121, 379—386).—When NaCl is the only supplement to a salt-poor diet the tissues of rats, except muscles, are more than normally hydrated. When Ca is the main mineral supplement the liver, muscle, and heart are less than normally hydrated.

M. W. G.

Action of oligosynergic elements in nutrition. G. BERTRAND (Bull. Soc. Sci. Hyg. Aliment., 1938, 26, 1—16).—The rôle of "trace" elements, notably Zn, in nutrition is discussed. A. G. P.

Importance of traces of elements in biological processes. G. BERTRAND (Ann. Fém., 1938, 4, 65—85).—The importance of minute amounts of certain elements, especially Mn and Zn, to plant and animal life is discussed. The essentials to plants and animals may be divided into plastic and catalytic elements, the aggregate of the former being controlled by traces of the latter. I. A. P.

Vitamins and tuberculosis. F. HASSELBACH (Z. Vitaminforsch., 1938, 7, 152—173).—A review.

Discussion on vitamins. (J. Pediat., 1938, 12, 529—538).—General reviews of vitamin-A and -B₁ by M. S. ROSE, of heat-stable factors of the -B complex by H. C. SHERMAN, and of -C and -D by H. CHAPLIN. C. J. C. B.

Value of a cod-liver oil concentrate in preventing weight loss in the new born. J. R. DOLCE (Arch. Pediat., 1938, 55, 185—190).—Marked reduction in the amount of wt. loss during the first few days of life was found in a group of new-born infants receiving White's cod-liver oil concentrate 3 times daily, compared with a control group. 18 of 22 infants gained an average of 6.5 oz. over their birth wt. by the end of 10 days. Similar results were obtained when vitamin-A and -D were given by intubation in antiseptic oil. C. J. C. B.

Influence of fat-soluble vitamins on egg production and egg-shell composition. A. D. HOLMES, F. TRIPP, and P. A. CAMPBELL (Poultry Sci., 1937, 16, 404—415).—Use of sardine oil as a supplementary source of vitamin-A and -D with a balanced ration increased egg production and average wt. of shells, the -A and -D potency of eggs, and the -A reserve (liver) of hens. A. G. P.

Fat-soluble vitamins. II. Vitamin-A and carotenoids. W. HALDEN (Fette u. Seifen, 1938, 45, 211—215; cf. A., 1937, III, 187).—A short review of the occurrence, constitution, and analytical separation of vitamin-A and allied carotenoids. E. L.

Vitamin-A and hepatic reticulo-endothelial system. H. WENDT and D. KÖNIG (Klin. Woch., 1937, 16, 1253—1254).—Vitamin-A disappears from the liver of rabbits, treated with phenylhydrazine, which show changes in the Kupffer cells. No -A was found after treatment with Bi. F. W. L.

Importance of the liver in overdosage of vitamin-A and carotene. I. I. IKEGAKI (Z. Vitaminforsch., 1938, 7, 113—118).—The liver effects storage of vitamin-A and carotene and also converts the latter into -A. Intramuscular injection of 20% alcohol causes a lowering of the -A reserve of the liver. The -A content of the bile increases more than that of the serum in rabbits after excessive feeding of carrots, but no pathological signs of hypervitaminosis are observed in this case or after subcutaneous injection of an -A prep. P. G. M.

Night-blindness and vitamin-A deficiency. Use of the biophotometer. N. T. GRIDGEMAN and H. WILKINSON (Lancet, 1938, 234, 905—907).—The biophotometer is a new American instrument used for the detection and quant. assessment of hemeralopia. Its construction and use are described. C. A. K.

Dark-adaptation test for vitamin-A deficiency. C. E. PALMER (Amer. J. Publ. Health, 1938, 28, 309—315).—The effect of the administration of vitamin-A on biophotometric dark-adaptation measurements on school children is described. No significant difference was observed between groups on diets supplemented and not supplemented with -A. W. L. D.

Symptoms of vitamin-A deficiency in chicks. B. W. HEYWANG (Poultry Sci., 1937, 16, 388—392).—Ataxia due to vitamin-A deficiency did not always coincide with cessation of body-wt. increase in chicks. Ataxia was frequently followed by formation of deposits in the bursa of Fabricius and of a retention cyst. A. G. P.

Lysozyme studies of tissues from animals deficient in vitamin-A. P. S. PRICKETT, N. J. MILLER, and F. G. McDONALD (J. Bact., 1937, 33, 39).—Dietary deficiency of vitamin-A does not lower the concn. of lysozyme in the tissues of rats. Lysozyme and -A are independent factors in the defensive system against infection. An -A-free diet induces greater lysozyme production as a compensatory response. Substitution of lysozyme fluid for drinking water for rats receiving an -A-deficient diet results in normal levels of lysozyme in tissues. A. G. P.

Absorption of carotene. W. HEYMANN (Amer. J. Dis. Children, 1935, 51, 273—283).—The yellow skin coloration occurring in children who have received prolonged and heavy dosages of carotene tends to diminish even when carotene feeding is continued. CH. ABS. (p)

Excretion of vitamin-A in human faeces. H. WENDT (Klin. Woch., 1937, 16, 1175—1177).—A method of extraction and of estimation by the SbCl₃ method is described. The daily excretion of healthy subjects on hospital diet was 30—245 blue units. Daily dosage with 60 drops of vogan had slight effects until the 12th to 30th day, when a sudden increase up to several thousand units occurred. An immediate increase in excretion was found in patients with impaired intestinal absorption. F. W. L.

Vitamin-A content of pilchard oil. H. I. MILNE, L. RUDOLPH, and W. D. McFARLANE (Poultry Sci., 1937, 16, 383—387).—When fed to chicks in

generous proportions pilchard oil appeared as effective as a good grade of cod-liver oil, but at min. requirement rates may show marked inferiority. The spectrophotometric method for determining vitamin-A in the unsaponifiable fraction of pilchard oil (allowance being made for carotenoids) is a reasonably accurate measure of its growth-promoting val. No other growth-promoting factor was detectable in the oil.

A. G. P.

Effect of solvents on the absorption spectrum of vitamin-A. (A) E. L. SMITH, B. E. STERN, and F. E. YOUNG. (B) R. A. MORTON (Nature, 1938, 141, 551—552, 552).—(A) The vitamin-A absorption bands of fish-liver oils and concentrates vary both in position and in magnitude with a change of solvent. Data for three fish-liver oils and two concentrates in alcohol, cyclohexane, hexane, ether, and CHCl_3 for absorption at 328 m μ . are recorded. In CHCl_3 , the max. shifts to approx. 333 m μ . Irregularities in the effects of the solvents, and the effect of irradiation and storage on the oils, are probably due to differences in the proportion of *cis-trans* isomerides of vitamin-A.

(B) The different fractions obtained by mol. distillation of a halibut intestinal oil show variations in the ratio of the ultra-violet absorption (328 m μ .) to the SbCl_3 colour test max. (620 m μ .), which may be due to a partial separation of *cis-trans* isomerides.

L. S. T.

Physiology of vitamin-B₁. G. R. COWGILL (J. Amer. Med. Assoc., 1938, 110, 805—812).

R. L. N.

"Alcoholic" beri-beri. N. L. PRICE (Lancet, 1938, 234, 831—834).—A man aged 36 years, addicted to alcohol, showed severe congestive heart failure with signs of polyneuritis and recovered completely on treatment with rest, high-calorie diet, and large amounts of vitamin-B₁.

C. A. K.

Effects of vitamin-B (B₁) therapy on the polyneuritis of alcohol addicts. R. GOODHART and N. JOLLIFFE (J. Amer. Med. Assoc., 1938, 110, 414—419).—17 alcohol addicts having uncomplicated mild polyneuritis were successfully treated by either synthetic or natural vitamin-B₁. Some patients having cirrhosis of the liver similarly responded to this treatment.

R. L. N.

Interaction of vitamin-B₁ in enzymic reactions. H. TAUBER (J. Biol. Chem., 1938, 123, 499—506; cf. A., 1938, III, 340).—Duodenal enzyme preps. convert vitamin-B₁ into cocarboxylase, but do not hydrolyse the latter. The optimum p_{H} is 6.8, but synthesis can take place on both sides of this p_{H} as well as in absence of $\text{PO}_4^{''}$. Phosphorylation is probably catalysed by an enzyme or system, phosphatase, which is different from the phosphatases. Cocarboxylase is rapidly hydrolysed by kidney tissue and by boiling dil. HCl. The co-enzyme is partly purified by pptn. as the Pb salt and liberation of the ester by H_2S . Ingestion of large amounts of -B₁ did not result in excretion of the ester, most of the -B₁ appearing in the urine after 5—7 hr.

J. N. A.

Phycomyces test for examination of the organs of normal and B₁-avitaminous animals. Micro-method. W. H. SCHOPFER and A. JUNG (Z. Vitamin-

forsch., 1938, 7, 143—152).—Details are given of a biological method of determining vitamin-B₁ based on the fact that a strain of *Phycomyces* cannot grow on a synthetic medium in the absence of aneurin. A phycomyces-unit is defined.

P. G. M.

Chemistry of thiamin (vitamin-B₁). R. R. WILLIAMS (J. Amer. Med. Assoc., 1938, 110, 727—732).

R. L. N.

Lactoflavin tolerance. V. DEMOLE (Z. Vitamin-forsch., 1938, 7, 138—143).—Lactoflavin is non-toxic to fish, mice, rats, rabbits, cats, and dogs. The rat tolerates per os 5000 times the therapeutic dose. Previous findings of toxicity were due to the substance (e.g., urea) used to increase the solubility in water.

P. G. M.

Intestinal emphysema of swine. D. F. EVELLETH and H. E. BIESTER (Amer. J. Hyg., 1938, 27, 364—369).—Intestinal emphysema in swine can be produced by a dietary deficiency. The anti-emphysema factor is present in whole maize, unpolished rice, skim milk powder, and yeast; it is associated with the vitamin-B complex but not with -B₁. A ration containing 50% of skim milk protected swine although one containing 20% did not. A ration of yeast 5%, skim milk powder 20%, and unpolished rice 75% protected 4 out of 5 pigs. Sufficient -B₁ must be present to support growth. Chicks and rats did not develop intestinal emphysema on rations which produced lesions in swine. There was no evidence of a toxic substance in polished rice.

G. P. G.

Effect of nicotinic acid on pellagrins maintained on a pellagra-producing diet. J. M. GRANT, E. ZSCHESCHE, and T. D. SPIES (Lancet, 1938, 234, 939—941).—Nicotinic acid produced prompt improvement in the mucous membrane lesions of 7 pellagrins kept on a pellagra-producing diet. The increased coproporphyrinuria disappeared. It is suggested that pellagra-producing diets are deficient in several chemical substances.

C. A. K.

Case of pellagra treated with nicotinic acid. J. C. HAWKSLEY (Lancet, 1938, 234, 944—945).—Nicotinic acid caused rapid improvement in a case of pellagra produced by a diet given for gastric trouble.

C. A. K.

Use of nicotinic acid in treatment of pellagra. T. D. SPIES, C. COOPER, and M. A. BLANKENHORN (J. Amer. Med. Assoc., 1938, 110, 622—627).—11 cases of pellagra were successfully treated by nicotinic acid, and were maintained symptom-free on a pellagra-producing diet, but supplemented with the acid. The abnormally high amount of porphyrin (coproporphyrin I and III) in the urine diminished rapidly on treatment. Tests on 2 cases of pernicious anaemia showed that nicotinic acid is not the extrinsic factor.

R. L. N.

Effect of yeast and nicotinic acid on porphyrinuria. T. D. SPIES, E. S. GROSS, and Y. SASAKI (Proc. Soc. Exp. Biol. Med., 1938, 38, 178—181).—Nicotinic acid has the same effect as yeast in decreasing the haematoporphyrin in the urine of patients with pellagra and various other diseases.

V. J. W.

Antidermatitic vitamin of yeast. R. KUHN and G. WENDT (Ber., 1938, 71, [B], 780—782).—In yeast,

the antidermatitic vitamin- B_6 occurs in a complex, non-dialysable form unstable to heat or alkali. Its physiological action is described. The complex, named "aderminprotein," can be purified according to the methods of protein chemistry, without loss of vitamin activity; the prosthetic group can be liberated by heat. It is converted by acetic anhydride into *acetyladermin*, b.p. $85-90^\circ/0.0001$ mm., transformed by HCl into *adermin hydrochloride*, m.p. $204-205^\circ$ (decomp.), which requires the presence of a "filtrate factor" for the development of full physiological activity. H. W.

Crystalline vitamin- B_6 . J. C. KERESZTESY and J. R. STEVENS (Proc. Soc. Exp. Biol. Med., 1938, 38, 64-65).—A substance has been isolated from rice bran of which 0.1 mg. cures severe symptoms of B_6 -deficiency in rats within 14 days. It is a cryst. hydrochloride of a N base, m.p. 204° (decomp.). V. J. W.

Vitamin-C and nutrition. R. C. VETTER and W. WINTER (Z. Vitaminforsch., 1938, 7, 173-198).—A review.

Human vitamin-C balance. II. Estimation of daily usage and deficit. P. HAMEL (Klin. Woch., 1937, 16, 1105-1110).—Marked retention followed daily administration of the synthetic and natural vitamin. The increased usage following increased intake may be a sp. dynamic action. For ergometric exercises of 25,000 kg. an increase of 45-55 mg. of -C was required. For the saturation deficit 200 mg. of redoxon were initially given, followed by smaller doses until a const. level of retention occurred. The max. and min. vals. are recorded for 5 normal adults. F. W. L.

Influence of ascorbic acid on liver-glycogen. M. SHIMAMURA (Folia Pharmacol. Japon., 1938, 25, 30-31).—Liver-glycogen of guinea-pigs with scurvy is diminished; injections of ascorbic acid increase it. A. S.

Vitamin-C and liver-glycogen; antagonistic action of ascorbic acid, thyrotropic hormone, and thyroxine. H. FISCHBACH and A. TERBRÜGGEN (Klin. Woch., 1937, 16, 1125).—Large doses of ascorbic acid prevent the effect on body-wt. and liver-glycogen of small amounts of thyrotropic hormone; the thyroid changes from large doses of the hormone cannot, but glycogen mobilisation can, be inhibited. F. W. L.

Gastric ulceration from vitamin-C deficiency. H. HANKE (Klin. Woch., 1937, 16, 1205-1206).—A large majority of guinea-pigs with C-avitaminosis show ulceration of the stomach and duodenum. F. W. L.

Physiological range of vitamin-C saturation. T. BAUMANN (Klin. Woch., 1937, 16, 1246-1248).—The saturation level can be ascertained only when peroral dosage of 50-100 mg. has been continued until 60-80% reappears in the urine. This level varies between 0 and 40 mg. per kg. in adults. The concn. in fasting blood is 0.45-2.6 mg.-%. F. W. L.

Ascorbic acid saturation of the organism. W. NEUWEILER (Z. Vitaminforsch., 1938, 7, 128-138).

—Vals. greater than 0.001% for blood-ascorbic acid are adequate for health; at levels of 0.0006-0.00075% hypovitaminosis occurs in 50% of cases, whilst with less than 0.0006% severe hypovitaminosis occurs in all cases. P. G. M.

Vitamin-C saturation: kidney retention after an intravenous test dose of ascorbic acid. I. S. WRIGHT and E. MACLENATHEN (Proc. Soc. Exp. Biol. Med., 1938, 38, 55-59).—1 g. of ascorbic acid is injected intravenously and the amount present in the blood and urine is determined at intervals. Retention occurs in some individuals with N retention but no correlation with any kidney condition was discovered. V. J. W.

Possible case of low renal threshold for ascorbic acid. C. A. MAWSON (Lancet, 1938, 234, 890-891).—A patient with hæmorrhage from the gums showed a low plasma-ascorbic acid level (0.50-0.76 mg.-%) in spite of liberal administration of ascorbic acid in the diet. The urine contained 3.82 mg.-%. The saturation test showed max. excretion of ascorbic acid during the first 3 hr., with a max. plasma level of 1.65 mg.-%. It is suggested that there was a low renal threshold for ascorbic acid; the bleeding was stopped by giving enough of the substance to maintain a normal plasma level. C. A. K.

Pathogenesis of melæna neonatorum. H. WINKLER (Münch. med. Wschr., 1938, 85, 476-477).—Vitamin-C deficiency of the mother was found with the Harris and Ray test in cases of melæna neonatorum. Administration of 100 mg. of ascorbic acid per day to the infant cured the condition. A. S.

Lesions of mucous membranes in pregnancy and their treatment with ascorbic acid. H. J. KUTZLEB (Münch. med. Wschr., 1938, 85, 479-480).—Lesions of the mucous membrane of the mouth (gingivitis) and of the vulva during pregnancy caused by vitamin-C deficiency respond to treatment with ascorbic acid. A. S.

Relation between vitamin-C and basal sulphur and nitrogen metabolism in psoriasis vulgaris. F. REISS (Chinese Med. J., 1938, 53, 141-160).—Of 13 psoriasis patients on normal diet 12 had subnormal ascorbic acid excretion in the urine. 150 mg. of ascorbic acid were given daily by mouth for 3-5 days followed by 200 mg. intravenously for 3-6 days, but only a very small proportion was excreted and there was no improvement in the skin condition. During the vitamin-C administration the basal metabolic rate was unchanged, the urinary total N excretion was slightly, and the urinary total S excretion markedly, increased. The disturbed epidermal cell metabolism may be the cause of the greatly increased vitamin-C usage. P. C. W.

Problems of vitamin-C metabolism. H. SCHROEDER (Dtsch. med. Wschr., 1938, 64, 469-472).—The vitamin-C content of human blood, determined according to van Eekelen *et al.* (A., 1937, III, 231), is 8-12 mg.-% on a normal diet. Injection of ascorbic acid increases the -C content; exercise lowers it. A. S.

Vitamin-C content of the blood-plasma in normal and sick children. F. T. CHU and C. SUNG (*Chinese Med. J.*, 1937, 52, 791—806).—Simultaneous determinations of vitamin-C in the blood-plasma and in 24 hr. urine specimens were made before, during, and after -C medication. The vals. for deficient, intermediate, and saturated conditions in the body were thus found. 22 infants fed on cow's milk showed deficiency and the plasma content only rose slowly on ascorbic acid administration. 11 breast-fed infants showed no evidence of deficiency. In 17 cases of bacillary dysentery the plasma -C concn. was low and did not increase following orally given fruit juice or ascorbic acid. Parenteral injections, however, raised the content to normal vals. In kala-azar 7 cases with noma showed lower vals. than 7 cases without. The plasma concn. was also low in 9 cases of active tuberculosis in spite of breast milk and orange juice included in the diet.

P. C. W.

Vitamin-C content of human non-scorbutic cerebrospinal fluids. W. W. JETTER and T. S. BUMBALO (*Proc. Soc. Exp. Biol. Med.*, 1938, 38, 164—166).—The cerebrospinal fluid of 50 subjects contained 0.7—2.1 mg. of ascorbic acid per 100 c.c.

V. J. W.

Prophylaxis against bacillary dysentery. Preventive effect of vitamin-C. I. MIYAO (*Bull. Nav. Med. Ass. Japan*, 1938, 27, 2—3).—12 healthy monkeys fed on special diet developed a condition of partial undernourishment. 7 received a daily dose of vitamin-C by mouth or subcutaneously for 8 or 13 days. All 12 animals were then infected with paratyphoid bacilli by mouth. Of the 7 monkeys treated with -C only 1 developed dysentery, whereas the 5 control animals all developed dysentery after 1—2 days. C-avitaminosis raises susceptibility to bacillary dysentery.

M. H.

Influence of narcosis and operations on vitamin-C metabolism. T. BERSIN, H. J. LAUBER, and H. NAFZIGER (*Klin. Woch.*, 1937, 16, 1272—1274).—After narcosis, local anaesthesia, and operations, the vitamin-C requirement of rabbits increases.

F. W. L.

Significance of vitamin-C in the occurrence of oedema. I, II. J. DOI (*J. orient. Med.*, 1938, 28, 25—27).—In vitamin-C-deficient guinea-pigs as scurvy advances the plasma-protein falls, especially the albumin. There is a slight rise in tissue-protein and -water content. These results indicate increased capillary permeability in -C deficiency.

P. C. W.

Influence of vitamin-C in the production of oedema. J. DOI (*J. orient. Med.*, 1938, 28, 41—45).—Daily intraperitoneal injections of isotonic glucose and saline into normal and scorbutic guinea-pigs decreased plasma-albumin and tissue-protein and largely increased tissue-water content in scorbutic animals, many of which had ascites and oedema.

P. C. W.

Supply of native [East Indian] prisoners with ascorbic acid. J. C. LANZING, A. G. VAN VEEN, and M. AGOES (*Geneesk. Tijds. Nederl. Indië*, 1938, 78, 23—30).—Determinations of the vitamin-C content of the food and the level of the blood have been made

regularly on 81 prisoners during an outbreak of scurvy. The vitamin content of the food was adequate and the outbreak is ascribed to loss due to prolonged cooking. The -C level of the blood remains fairly const. for any one person. The average threshold val. was 7.34 mg. per l., but in 10 prisoners it was 16—17 mg. per l. 17 servants were examined; 50% had a high threshold val. The difficulties encountered in determinations of ascorbic acid in blood, especially in the tropics, are discussed.

Ascorbic acid content of Manchurian paprika. M. SUGIURA (*J. orient. Med.*, 1938, 28, 23).—The vitamin-C content varies in different varieties and in the same variety grown in different soils. No loss occurs if extraction and drying are carried out in vac. below 35°. The dry extract in 20 days loses 55% of its activity on exposure to air but only 13% in a corked container.

P. C. W.

"Symplex" compound of vitamin-C and protein. W. RUDOLPH (*Naturwiss.*, 1938, 26, 155—156).—The rate of oxidation of aq. ascorbic acid by atm. O₂ is decreased by the addition of small amounts of dried ovalbumin, phenylalanine, or cystine; glycine, α -alanine, and glutamic acid hydrochloride have the opposite effect. In nature ascorbic acid may exist as a relatively O₂-resisting symplex compound, with a suitable protein or protein degradation product.

W. O. K.

Antiscorbutic activity of methyl 2-keto-D-gluconate. P. GOTTARDO, jun., and C. O. MILLER (*Z. Vitaminforsch.*, 1938, 7, 118—125).—Oral administration of 30 mg. daily of the ester to guinea-pigs on a scorbutic diet prevents the appearance of scurvy, whilst 60 mg. daily causes healing of lesions already produced.

P. G. M.

Effect of ultra-acoustic waves on vitamin-C. M. KASAHARA and K. KAWASHIMA (*Klin. Woch.*, 1937, 16, 1191).—The vitamin is easily destroyed by this means.

F. W. L.

Cacothelin as a reagent for ascorbic acid. L. ROSENTHALER (*Z. Vitaminforsch.*, 1938, 7, 126—128).—When 0.5 c.c. of 0.5N-HCl is added to 4.5 c.c. of aq. 0.1% ascorbic acid, on addition of a few drops of aq. 0.2% cacothelin a lilac colour is developed at room temp. after a few min., whilst cysteine and glutathione react only after heating at 100°. Ascorbic acid, but not cysteine or glutathione even at 100°, reacts even in a 0.01% solution. Addition of 1 c.c. of conc. HCl to 4 c.c. of 0.002% aq. ascorbic acid yields a detectable colour at 100°.

P. G. M.

Determination of ascorbic acid by the methylene-blue method. A. A. POLICARD, M. FERRAND, and E. ARNOLD (*Bull. Soc. Chim. biol.*, 1938, 20, 165—172).—Modifications of the method of Martini and Bonsignore (*A.*, 1934, 1271) are described which permit the determination of 0.0045 mg. of ascorbic acid with an error of 5%.

A. L.

Method of determining ascorbic acid in skin. C. C. TORRANCE (*Science*, 1938, 87, 332).—Skin is heated in evacuated test-tubes with 8% acetic acid and 2% HPO₃ at 100° for 20 min. After centrifuging,

the sediment of softened skin is washed with 8% trichloroacetic acid and 2% HPO_3 and centrifuged again. The combined supernatant fluids are titrated with 2:6-dichlorophenol-indophenol solution according to the method of Bessey and King. L. S. T.

Antigenic properties of vitamin-D. J. ŠTEFL (Klin. Woch., 1937, 16, 1119—1121).—In cats and white mice administration of vitamin-D together with heterogeneous protein in oily or aq. solution produced a relative immunity to subsequently given lethal doses of -D dissolved in oil or emulsified with the same protein. Passive immunity can be produced with treated rabbits' serum. -D in aq. emulsion is 20 times as toxic as in solution in oil. Animals injected with -D are more sensitive to phenol.

F. W. L.

Injurious effect of vitamin-D on heart muscle. E. KIELHORN and H. RÜBENHAGEN (Dtsch. med. Wschr., 1938, 64, 472—475).—The electrocardiograms of infants and small children treated for many months with -D (vigantol) showed no pathological changes in the heart. A. S.

Comparative efficiency of vitamin-D from cod-liver oil and irradiated cholesterol for laying birds. R. M. BETHKE, P. R. RECORD, O. H. M. WILDER, and D. C. KENNARD (Poultry Sci., 1937, 16, 438—441).—Both sources of vitamin-D were equally effective. Laying birds require 50 U.S.P. units of -D per 100 g. of ration for max. hatchability of eggs. A. G. P.

Experimental rickets after photo-sensitisation by hæmatoporphyrin. P. MARIQUE (Bull. Soc. Chim. biol., 1938, 20, 325—342).—Contrary to the results of van Leersum (A., 1924, i, 455), injection of hæmatoporphyrin into rachitic rats on a diet deficient in salts and deprived of vitamin-D does not modify the spontaneous development of rachitic lesions. Addition of ergosterol to the diet did not cure the lesions. J. N. A.

Cod-liver oil tolerance in calves. G. K. DAVIS and L. A. MAYNARD (J. Dairy Sci., 1938, 21, 143—152).—No evidence in post mortem examination was found that feeding calves from birth to 9 months of age on cod-liver oil at a level up to 0.7 g. per kg. had any adverse effect on growth or physical condition. Slight muscular dystrophy was found in the animals fed the higher levels but the lesions were of a very minor character. It was deduced that cod-liver oil may be fed in amounts sufficient to provide vitamin-D without injury. W. L. D.

Vitamin-D precursors removed from human skin by washing. A. G. HELMER and C. H. JANSEN (Stud. Inst. Divi Thomae, 1937, 1, 207—216).—Rickets can be cured in rats by administration of (a) irradiated ether-extract of human sweat or (b) ether extract of sweat from irradiated subjects. D. B.

Production of an antirachitic provitamin from cholesterol.—See A., 1938, II, 231.

Recent research on vitamin-E. A. L. BACHARACH (Nutr. Abs. Rev., 1938, 7, 811—822).—A review.

Antisterility agents (vitamin-E). Identity of cumotocopherol and β -tocopherol. Fission of tocopherols with hydriodic acid.—See A., 1938, II, 241.

Vitamin-K in human pathology. H. DAM and J. GLAVIND (Lancet, 1938, 234, 720—721).—Intra-muscular injection of vitamin-K restored to normal the reduced clotting power of blood in 3 cases of obstructive jaundice. C. A. K.

(p) METABOLISM, GENERAL AND SPECIAL.

Mechanisms of tissue metabolic processes. J. K. PARNAS (Acta Biol. Exp., 1937, 11, 292—307).—A lecture. R. T.

Diseases of metabolism and nutrition. Review of recent contributions. R. M. WILDER and D. L. WILBUR (Arch. Int. Med., 1938, 61, 297—365). T. H. H.

Chemical and energetic metabolism during development of insects. V. Respiration of silkworms and the thermal effect of growth. K. BIAŁASZEWICZ (Acta Biol. Exp., 1937, 11, 229—272).—The O_2 intake of silkworm larvae falls from 1.388 c.c. per hr. during the first moult to 0.626 c.c. during the fourth moult. After moulting, the O_2 intake continues to fall, unless the larvae are fed, when it rises by 46—150%; following withdrawal of food this level is maintained for 2 hr., after which the O_2 intake gradually sinks to the initial post-moult level within 24 hr. About 5% of the extra O_2 intake during feeding is associated with the muscular effort involved. Following the fourth moult, the O_2 intake varies in parallel with the body wt. until the last days of feeding, when it falls abruptly, continues to diminish during the period of spinning the cocoon, and reaches a min. of 0.059 c.c. per g. per hr. in the middle of the pupal stage. The R.Q. rises from 0.5 to 0.99 during the feeding period, and then falls to a min. of 0.6 during pupation. The total O_2 intake during the last period of larval growth is 101—142 c.c. per g. of increment, corresponding with a heat production of 524—721 g.-cal., showing that the energetic efficiency of larval growth is of the same order as is that of embryonic growth in this insect. The real energetic efficiency of growth is greatest at the beginning of the fifth larval stage. R. T.

Effect of iodoacetate on the electrical potential and on the oxygen uptake of frog skin. W. L. FRANCIS and O. GATTY (J. exp. Biol., 1938, 15, 132—142).—The oxidative biochemistry of living frog skin in so far as it is concerned with the maintenance of the electrical potential across the skin was investigated by the use of the respiratory inhibitor iodoacetate. Internal supplies of carbohydrate and external supplies of *dl*-lactate, pyruvate, acetate, propionate, *n*- and *iso*-butyrate, and possibly crotonate can all be oxidised to precursors of the potential, but not external supplies of formate, glycollate, succinate, acrylate, malonate, *dl*- β -hydroxybutyrate, and acetoacetate. J. M. R.

Respiration of the egg and young of the smooth green snake, *Liopeltis vernalis* (Hailan). M. X.

ZARROW and C. M. POMERAT (Growth, 1937, 1, 103—110).— O_2 consumption and CO_2 production of eggs and snakes were measured in a modified Warburg respirometer at 12—30°. No significant change in R.Q. occurred during the late stages of embryonic growth, but there was a small increase on hatching.

W. F. F.

Changes with age in the basal metabolic rate in adult men. W. H. LEWIS, jun. (Amer. J. Physiol., 1938, 121, 502—516).—The rate of metabolism falls between the ages of 40 and 89 according to the equation: calories per sq. m. per hr. = $39.138 - 0.0678 \times \text{age}$. In each decade, the fall is 0.664 cal. per sq. m. per hr. For the entire series studied (ages 40—101) the mean was 34.667 cal. per sq. m. per hr.: standard deviation was 2.906 and the standard error 0.286 cal. For the evenly distributed group (ages 40 to 89) the mean was 34.814, the standard deviation 2.813, and the standard error of the mean 0.282.

M. W. G.

Restoration of nitrogen losses and the supply of the alimentary requirements of protein. A. ROCHE, J. ROCHE, S. DROUINEAU, and P. PASSELAIGUE (Bull. Soc. Chim. biol., 1938, 20, 217—251).—Adult rats were fed on a protein-deficient diet until 20% of their N was lost. Gelatin, gelatin + cystine, gelatin + tryptophan, gliadin, or gliadin + lysine was then added to the diet. In no case was the lost N replaced, though in all cases an initial period of N retention was followed by a period of negative N balance, preceding the deaths of the animals. No gain in wt. was observed.

A. L.

Developmental growth and nucleic acid components. IV. Thymine. F. S. HAMMETT and T. F. LAVINE (Growth, 1937, 1, 135—139).—Thymine from sheep thymus was added to the culture medium in which *Obelia geniculata* was grown. Proliferation and differentiation were accelerated, but the initiation and organisation phases were unaffected.

W. F. F.

Destruction of tryptamine and tyramine by animal tissues. E. WERLE and G. MENNICKEN (Biochem. Z., 1938, 296, 99—104; cf. A., 1937, III, 421).—Tryptamine and tyramine in presence (but not in absence) of O_2 are destroyed by slices or extracts of the kidney of the dog and pig. The destruction is inhibited by methylene-blue or octyl alcohol but not by NaN_3 , $CuSO_4$, $FeSO_4$, papain, or 0.001M-KCN. The rate of destruction depends on p_H , being max. at 8 and min. at 5 and 9.5. Dry preps. have no destructive power and the destructive power of extracts, whether dialysed or not, decreases rapidly on keeping (no destructive power after 2 days).

W. McC.

Rôle of arginine and histidine in synthesis of purines and creatine. C. DEGAN (Bull. Soc. Chim. biol., 1938, 20, 373—381; cf. A., 1938, III, 135).—Addition of arginine or histidine to the diet of a dog fed on carbohydrate and lard increased the amount of purines in the urine, arginine having the greater effect. Arginine, but not histidine, also increased the urinary creatine. Excretion of creatinine was scarcely affected; in general, it slightly decreased.

J. N. A.

Excretion of creatinine during athletic exercises. F. VON KRÜGER (Arbeitsphysiol., 1938, 10, 8—29).—2 hr. exercise daily at moderate temp. in a moist atm. did not affect the vol. of urine passed. It diminished the concn. of the urine and the excretion of solids but did not influence the excretion of creatinine in subjects on a creatine- and creatinine-free diet.

E. J. W.

Urea formation from glutamine. F. LEUTHARDT (Z. physiol. Chem., 1938, 252, 238—260).—Glutamine in presence of liver (guinea-pig, cat, rat) slices produces urea to the extent of 40—60% of that from the equiv. amount of NH_3 . Glutamic acid yields only small amounts of urea; pyrrolidone-2-carboxylic and not glutamic acid is probably the first intermediary. Urea formation from glutamine is independent of the respiratory substrate, whereas urea formation from NH_3 in the liver of fasting guinea-pigs in presence of glucose is 10—30% (depending on concn. of NH_4 salt) of that in presence of lactate or pyruvate. Ornithine also has no effect with glutamine but increases urea formation from NH_3 by 100% or more. Glutamine probably reacts with the urea-forming system without primary deamination; during the whole course of urea formation from glutamine, only traces of free NH_3 are detectable. Asparagine behaves similarly to glutamine. At p_H 7.4—7.6, liver-asparaginase is more active and produces more NH_3 than does -glutaminase. The reactivity of the acid amide group is restricted to the naturally occurring aminodicarboxylic acid amides; the acid amides of lactic and pyruvic acids do not yield urea. The mechanism and free energy changes of urea formation are discussed.

F. O. H.

Formation of urea in the animal organism. G. IKEDA (J. Biochem. Japan, 1938, 27, 141—156).—Perfusion of the dog's liver by blood containing citrulline and NH_3 results in the formation of urea. This urea production is diminished by starvation (to an extent proportional to duration of the fast) and, to a greater extent, by protein-fat diets (cf. Kitsugawa, A., 1936, 754).

F. O. H.

Liver-lipins of laying and non-laying birds. F. W. LORENZ, I. L. CHAIKOFF, and C. ENTENMAN (J. Biol. Chem., 1938, 123, 577—585).—In the livers of Leghorn fowls, the same concns. of free and combined cholesterol, phospholipins, and triglycerides are found in the mature and immature male and in the immature female. In the female, the onset of maturity leads to an increase in the triglycerides but no change in the phospholipins or cholesterol esters. Increasing the amount of dietary fat of the egg-laying bird causes a decrease in liver-triglyceride fat, which is more variable in birds on a low- than in those on a high-fat diet. The bearing of the results on ovarian activity is discussed.

T. F. D.

Fat metabolism in fishes. XII. Seasonal changes in composition of herring fat. J. A. LOVERN (Biochem. J., 1938, 32, 676—680; cf. A., 1937, III, 260).—Herring fat is characterised by an abnormally high content of C_{22} acids, unusually unsaturated C_{16} and C_{18} acids, and unusually satur-

ated C_{20} and C_{22} acids. Unsaturation of the various acid groups increases from April to June or July and then decreases to April. It is suggested that rapid intake of very unsaturated fat during June causes a temporary unbalance in hydrogenation, but this is soon modified. C_{16} acids are dehydrogenated instead of being hydrogenated, whilst C_{18} acids are not markedly affected. In the fasting herring, the more highly unsaturated components of the fat appear to be preferentially utilised. Immature herring have a more unsaturated fat than adult herring caught at the same period.

J. N. A.

Conversion of fat into sugar. II. W. HAARMANN and E. SCHROEDER (Biochem. Z., 1938, 296, 35—46; cf. A., 1936, 235).—When β -hydroxy- or $\alpha\beta$ -dihydroxybutyric acid is added to surviving tissues (skeletal and cardiac muscle, liver, kidney, spleen, brain) of dogs or cats lactic acid is produced. The simultaneous decrease in the carbohydrate content of the tissues, where it occurs, is less than equiv. to the increase in lactic acid, and increase in carbohydrate content occurs in some cases. Probably the biological conversion of butyric acid into carbohydrate proceeds by way of crotonic, β -hydroxybutyric, acetoacetic, $\alpha\beta$ -dihydroxybutyric, $\alpha\beta$ -dihydroxycrotonic, and $\alpha\beta$ -diketobutyric acid, methylglyoxal, and lactic acid.

W. McC.

Different clinical groups of xanthomatous diseases; clinical physiological study of 22 cases. S. J. THANNHAUSER and H. MAGENDANTZ (Ann. intern. Med., 1938, 11, 1662—1746).—A review. It is suggested that essential xanthomatosis is an intracellular disorder of cholesterol metabolism in reticulum cells.

C. A. K.

Carbohydrate metabolism in the liver of rats with B_1 -avitaminosis. E. GOLDSCHMIDT and A. LEWIN (Klin. Woch., 1937, 16, 1285).—Fermentation of methylglyoxal was greater than in the controls. It was inhibited by 0.01M-KCN, less by 0.01M- As_2O_3 . Addition of vitamin- B_1 and KCN increased the fermentation in the control livers. Glucose fermentation was increased by 0.01M-KCN but As_2O_3 and $-B_1$ had slight effects. The respiration of livers of avitaminous animals with glucose substrate is less than with methylglyoxal and on the addition of $-B_1$ diminishes further, but this addition to the controls increases respiration.

F. W. L.

"Imperceptible" gain of weight. T. SCHLEINIG (Dtsch. Arch. klin. Med., 1938, 181, 560—565).—Severe diabetics who formed carbohydrates from proteins and fats lost more wt. per day than normal control subjects fed on the same diet. An "imperceptible gain of wt." was never observed.

A. S.

Metabolism of dog made diabetic by anterior pituitary injections. H. P. MARKS and F. G. YOUNG (J. Physiol., 1938, 92, 14p).—With such a dog on a diet of lean meat and boiled liver (protein mainly), the corr. average D/N ratio is about 3:1, probably indicating maximal formation of sugar from protein; on this diet extra glucose given by mouth appears to be almost quantitatively excreted. When much of the protein is replaced by equicaloric amounts of preformed carbohydrate, the sugar ex-

cretion is less than the amount to be expected. On a diet almost entirely of fat, glycosuria is practically abolished and ketonuria definitely diminished.

J. A. C.

Dogs made permanently diabetic by anterior pituitary injections. F. G. YOUNG (J. Physiol., 1938, 92, 15p; cf. A., 1937, III, 379).—The diabetic condition so produced differs from that of depancreatized dogs most strikingly in that in the former the dog is able to survive without insulin, retaining good vigour without any very great loss of wt. The severity of the diabetic condition is comparable with that of depancreatized animals.

J. A. C.

Carbohydrate metabolism of the foetal dog under the influence of insulin. H. SCHLOSSMANN (J. Physiol., 1938, 92, 219—227).—The glycogen or total carbohydrate content of foetal liver and muscle is not influenced by the intraperitoneal injection of high doses of insulin; the foetal dog is highly resistant to insulin; blood-sugar falls slowly and convulsions are not observed with large doses. The lactic acid level of the foetal blood rises a few hr. after the injection of insulin; the difference between the lactic acid levels in the blood of the umbilical artery and umbilical vein is increased many times above the normal; about $\frac{2}{3}$ of the glucose which passes from the mother to the foetus in order to compensate the foetal hypoglycæmia is returned to the mother in the form of lactic acid. Under the influence of insulin the foetal carbohydrate metabolism is characterised by a high rate of aerobic glycolysis.

J. A. C.

Treatment of diabetes with a diet rich in carbohydrates and poor in fats. I, II. R. YAMAUTI (Tôhoku J. exp. Med., 1938, 32, 268—288, 289—308).—I. The blood-sugar of patients with severe diabetes is markedly lowered on a fat-rich diet. As the same blood-sugar changes occur in fasting diabetics the effect of the fat diet is not sp. Fat added to a mixed diet increases the blood-sugar of diabetics and of patients suffering from Weil's disease.

II. A diet rich in carbohydrates and poor in fats is recommended for diabetics. Details of treatment are given.

A. S.

Rôle of the skin in carbohydrate metabolism. C. SELLEI and M. SPIERA (Biochem. Z., 1938, 296, 83—89).—In rats on a mixed diet the average sugar contents of the blood and skin are 0.174 and 0.180 g. per 100 g. respectively, the corresponding vals. for fasting rats being 0.108 and 0.139 g. Both vals. increase greatly after subcutaneous injection of glucose but return to normal after 3—4 hr. Injection of adrenaline causes increase in the reducing power of the blood but decrease in that of the skin, and injection of insulin causes diminution in that of the blood but (usually) increase in that of the skin, the changes not being proportional to the dose of insulin. Administration of glandular preps. causes alteration in the reducing power of the skin without affecting that of the blood. Substances which block the reticulo-endothelial system decrease the reducing power of the blood but increase that of the skin. It is concluded that the skin stores carbohydrate and shares in the maintenance of carbohydrate equilibrium.

W. McC.

Cyclic reaction scheme illustrating carbohydrate metabolism. V. R. POTTER and C. A. ELVEHJEM (J. Chem. Educ., 1938, 15, 89—91).—Reactions involved in muscle contraction and in glycogen synthesis are represented graphically. The cyclic nature of the scheme emphasises the dynamic aspect of the system. PO_4''' transfer is the dominant feature. L. S. T.

Carbohydrate metabolism of brain. VI. Isolation of glycogen. S. E. KERR (J. Biol. Chem., 1938, 123, 443—449).—A polysaccharide from dog's brain was identical with liver-glycogen in all respects. P. G. M.

Effect of caffeine on carbohydrate and protein metabolism. E. ATZLER, G. LEHMANN, and A. SZAKALL (Arbeitsphysiol., 1938, 10, 30—56).—Caffeine did not alter significantly the PO_4''' metabolism of dogs working in a treadmill unless carbohydrate was given. After glucose plus caffeine, phosphates were excreted when exercise ceased. The R.Q. falls slowly in the recovery phase after caffeine plus carbohydrate. Caffeine therefore unfavourably influences the recovery processes. It leads to a fall in the Cl' balance and the blood-Cl' which may act adversely on the heart during exercise. Caffeine diminishes the ability of the liver to deaminate amino-acids and increases the sp. dynamic action of proteins. E. J. W.

Rate of disappearance of intravenously administered glucose in the human subject. M. PIJOAU and J. G. GIBSON (Amer. J. Physiol., 1938, 121, 534—536).—Glucose given intravenously (25 g.) disappears rapidly from the circulation. 87.5% is removed within 4 min. and 89% at the end of 36 min. There was no rise in the R.Q. until 36 min. had elapsed. M. W. G.

Conjugated glycuronic acids in the animal organism. W. MOZŁOWSKI (Acta Biol. Exp., 1937, 11, 348—356).—A lecture. R. T.

Decomposition of glycogen in muscle extracts. E. M. MYSTKOWSKI (Acta Biol. Exp., 1937, 11, 197—219).—Glycogenolysis and phosphorolysis in rabbit's muscle extracts are independent and competing processes, the former being activated by Cl' and the latter by PO_4''' . Starch and glycogen, but not products of enzymic hydrolysis (muscle- and salivary amylase, taka-diastrase, e.g., dextrins, maltose, are readily phosphorylated by the extracts, with production of hexose monophosphate. The amount of amylase in muscle tissue is small, and its activity is practically nil in well-dialysed extracts (absence of Cl') which, however, still contain enough PO_4''' to render phosphorylation possible. Addition of myosin or globulin-X to the extracts does not influence their phosphorylatic, but depresses their amyolytic, activity. R. T.

Action of nucleotides in disruptive phosphorylation of glycogen. G. T. CORI, S. P. COLOWICK, and C. F. CORI (J. Biol. Chem., 1938, 123, 381—389).—Adenylic acid exerts a max. effect on the esterification of glycogen by H_3PO_4 at a concn. of 0.001M. Inosic acid is antagonistic to the action of adenylic acid and is only feebly active by itself. Adenosine triphosphate

is inactive if pyrophosphatase is absent from the extracts. Deaminase and pyrophosphatase can be adsorbed from fresh extracts on C. P. G. M.

Phosphorylation of *d*-ribose in adenosine and subsequent decomposition of the ester with formation of triose phosphate in blood. Z. DISCHE (Naturwiss., 1938, 26, 252—253).—In presence of adenosine, a suspension of glucose-free erythrocytes, haemolysed and treated with NaF, Na bromoacetate, and Na_3PO_4 , shows a diminution of PO_4''' after 5 days at room temp. Simultaneously the pentose content decreases due to phosphorylation by PO_4''' . The decomp. of adenosine gives triose phosphate and Harden-Young ester, and pentose mono- and di-phosphates which are hydrolysed to triose phosphate and glycollaldehyde. J. D. R.

Phosphorylations in tissue glycolysis. J. WAJZER and R. LIPPMANN (Bull. Soc. Chim. biol., 1938, 20, 312—324).—Total and sol. P, inorg. P, esters hydrolysable by alkali, adenosine triphosphate, and hexose monophosphate in various organs of the dog, rabbit, and guinea-pig were determined. The curves for acid hydrolysis of adenosine triphosphate in the organs are all of the same general shape, showing a rapid rise during the first 7—10 min. and then a very gradual rise during the next 170 min. Aq. extracts of guinea-pig's liver and kidney form lactic acid from hexose monophosphate, but do not attack glycogen, glucose, or hexose diphosphate, and they are not activated by adenosine triphosphate. A pulp of the organs contains a desmoenzyme which decomposes glucose and glycogen. The liberation of inorg. P has no definite relation to glycolysis. NaF inhibits phosphorolysis and increases the esters hydrolysable by acid. Phloridzin causes disappearance of glycogen and inhibits formation of lactic acid but does not affect hexose monophosphates. Adrenaline accelerates the decomp. of glycogen and formation of hexose monophosphate and lactic acid. J. N. A.

Formation of glucose-1-phosphoric acid in extracts of mammalian tissues and yeast. G. T. CORI, S. P. COLOWICK, and C. F. CORI (J. Biol. Chem., 1938, 123, 375—380).—Glucose-1-phosphoric acid is formed from glycogen and inorg. PO_4 by dialysed extracts of brewers' yeast and rabbit's brain, heart, liver, and, to a smaller extent, kidney. The tissue extracts contain less "conversion" enzyme than muscle extracts which give rise to a higher proportion of hexose-6-phosphoric acid on the addition of Mg^{++} . Adenylic acid catalyses the formation of glucose-1-phosphoric acid. P. G. M.

Radioactive phosphorus as indicator of phospholipin metabolism. II. Rôle of stomach and small and large intestine in phospholipin metabolism in presence and absence of ingested fat. B. A. FRIES, S. RUBEN, I. PERLMAN, and I. L. CHAIKOFF (J. Biol. Chem., 1938, 123, 587—593; cf. A., 1938, III, 136, 220).—Using radioactive P as indicator, the major part of the phospholipin turnover by the gastro-intestinal tract, in both absence and presence of ingested fat, is shown to occur in the small intestine and not in the stomach or large intestine (rat). Removal of the gastro-intestinal

tract and kidneys does not greatly influence the phospholipin turnover by the liver. T. F. D.

Application of isotopes to the study of intermediary metabolism. R. SCHOENHEIMER and D. RITTENBERG (Science, 1938, 87, 221—226).—A summary. L. S. T.

Formation of α -ketoglutaric acid in animal metabolism. P. E. SIMOLA and E. E. KRUSIUS (Suomen Kem., 1938, 11, B, 9).—Ingestion of succinic, fumaric, malic, citric, and α -ketoglutaric acids by rats causes excretion of the last-named acid in the urine. Lactic acid has no such effect. M. H. M. A.

Mechanism of citric acid formation in the animal organism. P. E. SIMOLA and H. ALAPEUSO (Suomen Kem., 1938, 11, B, 17—18).—Citric acid is formed by brain tissue *in vitro* on addition of pyruvic, α -ketoglutaric, succinic, butyric, β -hydroxybutyric, acetoacetic, maleic, malic, and fumaric acids. Maleic is the least, and malic and fumaric acids are the most, effective. Acetic and malonic acids and acetaldehyde are inactive. A scheme is proposed for the formation of citric acid from the above acids with oxalacetic acid as intermediary. M. H. M. A.

Citric acid formation in rats. P. E. SIMOLA, E. E. KRUSIUS, and H. ALAPEUSO (Suomen Kem., 1938, 11, B, 18; cf. preceding abstract).—Greatly increased excretion of citric acid occurs in rats fed with pyruvic, α -ketoglutaric, succinic, fumaric, malic, β -hydroxybutyric, or acetoacetic acid. M. H. M. A.

Effect of salt deficiency in man on volume of extracellular fluids, and on composition of sweat, saliva, gastric juice, and cerebrospinal fluid. R. A. McCANCE (J. Physiol., 1938, 92, 208—218).—NaCl deficiency (by diet and sweating) produces (1) a reduction (28—38%) in vol. of body-fluids in which injected sucrose or inulin is dissolved (extracellular fluids); (2) a fall in [Na], a rise in [K], and no consistent change in [Cl] in resting saliva; (3) a variable reduction or little change in the free and total HCl and in the total Cl of gastric juice and a small fall in its Na and rise in its K; (4) a fall in both Na and Cl of cerebrospinal fluid; (5) a considerable but variable fall in the [NaCl] in sweat; adaptation to repeated sweating does not contribute to the result. J. A. C.

Mineral metabolism in the animal organism. III. Conception and significance of salt ratios in foods, with reference to the calcium and phosphorus supply. L. URBÁNYI (Mezőg. Kutat., 1938, 11, 13—36).—A review. A. G. P.

(q) PHARMACOLOGY AND TOXICOLOGY.

Mode of action of prontosil. BÜRGERS (Dtsch. med. Wschr., 1938, 64, 598—601).—Addition of prontosil S and prontosil album does not increase the bactericidal action of human, horse, rabbit, or guinea-pig serum against hæmolytic streptococci. Prontosil does not increase the phagocytic action of leucocytes towards streptococci. Intracutaneous injection of hæmolytic streptococci suspended for 12 hr. (and not

less than 5 hr.) in prontosil S solutions of 1:1000, 1:10,000, or 1:30,000 produces in rabbits only slight transient reddening and inflammation. Control injections of streptococci alone produce abscesses. The effects of viridans streptococci were not inhibited by prontosil. It is concluded that prontosil penetrates into and damages streptococci and inhibits toxin formation. A. S.

Acute hæmolytic anæmia developing during streptococcus sepsis. Report of a case in which sulphanilamide was given after the anæmia had developed. R. M. GREENTHAL (J. Pediat., 1938, 12, 517—521).—A child with a streptococcal throat infection developed an acute hæmolytic anæmia a few days after the onset of the illness. The blood culture grew hæmolytic streptococci. Sulphanilamide was given for 4 days; the blood culture became sterile and after 5 blood transfusions recovery was complete in a month. C. J. C. B.

Effect of sulphanilamide on the oxygen capacity of the blood. J. W. MULL and J. T. SMITH (J. Amer. Med. Assoc., 1938, 110, 439—440).—Following treatment of a patient with sulphanilamide the O_2 content and O_2 capacity of the blood fell sharply. R. L. N.

Effect of prontosil on blood cells. W. B. KREUTZMANN and J. L. CARR (Proc. Soc. Exp. Biol. Med., 1938, 38, 19—21).—Intramuscular injections of 0.25 g. of red prontosil per kg. were given daily to rabbits for 21 days. They showed no change in the red cell count or in hæmoglobin but a slight increase in stippled erythrocytes and eosinophilic polymorphonuclear cells and some congestion of the spleen. V. J. W.

Acetylation of sulphanilamide by liver tissue *in vitro*. J. S. HARRIS and J. R. KLEIN (Proc. Soc. Exp. Biol. Med., 1938, 38, 78—80).—Various tissue slices of the rabbit and rat were shaken for 4 hr. in Ringer's solution containing sulphanilamide in concn. of 20—200 mg.-% in an atm. of 5% CO_2 and 95% O_2 . In all the experiments with sliced rabbit liver acetylation of the sulphanilamide took place. No other tissues were effective and rat liver was variable. The change was increased by the addition of acetate, pyruvate, lactate, or acetoacetate. V. J. W.

"Protein effect" of prontosil compounds. K. SOEHRING (Biochem. Z., 1938, 295, 265—282; cf. Labes and Billmann, A., 1935, 120).—Prontosil S (but not prontosil base or prontosil album) combines with or is adsorbed by caseinogen, albumin, denatured albumin, globulin, and the proteins of *B. coli*. No relation occurs between the chemotherapeutic action of the compounds and the extent to which they react with proteins. W. McC.

Inhibitory effect of sulphanilamide on tuberculosis. A. R. RICH and R. H. FOLLIS (Bull. Johns Hopkins Hosp., 1938, 62, 77—84).—Sulphanilamide exerted a striking inhibitory effect on the development of experimental tuberculosis in the guinea-pig although no conclusions can yet be drawn as to its effect in human tuberculosis. T. F. D.

Sulphanilamide in the treatment of chancroid. H. M. HANSCH (Lancet, 1938, 234, 886—888).—

Sulphanilamide, given in 20 cases of chancroid, produced rapid healing of the ulcer and subsidence of the bubo in 5–10 days. C. A. K.

Action of sulphanilamide in rheumatic fever. H. F. SWIFT, J. K. MOEN, and G. K. HIRST (J. Amer. Med. Assoc., 1938, 110, 426–434).—Sulphanilamide therapy in 9 cases of active rheumatic fever caused marked toxic effects and produced no beneficial effect. R. L. N.

Treatment of a case of influenzal meningitis with immune serum and sulphanilamide. H. W. TAYLOR (Arch. Pediat., 1938, 54, 131–134).—The patient died. C. J. C. B.

Treatment of meningitis due to the hæmolytic streptococcus with sulphanilamide. N. SILVERTHORNE and A. BROWN (J. Pediat., 1938, 12, 504–506).—Of 93 patients with hæmolytic streptococcal meningitis treated by ordinary methods including scarlet fever antitoxin, between 1924 and 1936, only one recovered. Of 9 patients treated during 1937 with sulphanilamide and daily spinal drainage but without antitoxin, 5 recovered. C. J. C. B.

Four cases of meningitis treated with prontosil. F. H. JACOB (Brit. med. J., 1938, I, 887–888).—4 cases of meningococcal meningitis (3 cases showed Gram-negative diplococci in films; no cultures made) were successfully treated with prontosil. In two cases a late rise of temp. was attributed to the drug and a papulo-erythematous rash appeared in one case. C. A. K.

Sulphanilamide in meningitis. J. B. NEAL and E. APPELBAUM (Amer. J. Med. Sci., 1938, 110, 175–182).—17 cases of meningitis due to hæmolytic streptococcus were treated with sulphanilamide, with recovery of 13. In 14 cases of pneumococcal meningitis similarly treated 3 survived. The results of this form of therapy in hæmolytic infections were excellent, whilst pneumococcus and meningococcus infections apparently showed some beneficial response. R. L. N.

Pneumococcal meningitis treated with prontosil soluble. J. LANDON (Brit. med. J., 1938, I, 844–845).—A case of pneumococcal meningitis was treated with intramuscular injections of prontosil soluble, and recovered. C. A. K.

Sulphanilamide therapy in meningococcal meningitis. L. J. WILLIEN (J. Amer. Med. Assoc., 1938, 110, 630–632).—5 cases of meningococcal meningitis were successfully treated by sulphanilamide therapy. Oral administration gave satisfactory results. R. L. N.

Bacteriostatic action of sulphanilamide on meningococcus in spinal fluid. E. NETER (Proc. Soc. Exp. Biol. Med., 1938, 38, 37–40).—Sulphanilamide in concn. of 8 mg.-% stops the growth of meningococci in cerebrospinal fluid during 48 hr. and subsequent subcultures on agar gave no growth. V. J. W.

Chemotherapy of virus infections. C. L. OAKLEY (Brit. med. J., 1938, I, 895–896).—The following drugs were administered by mouth to mice previously infected intranasally with sterile gradocol filtrates of influenza virus (W.S. strain); (1) sulphanilamide

(2) 4:4'-diaminodiphenyl sulphone, (3) 4-amino-4'-benzylideneaminodiphenyl sulphone, (4) Na sulphanilyl sulphanilate, (5) 4:4'-diaminodiphenyl sulphone glucoside. Mice given (1) and (3) died sooner than controls; those given (2) and (4) showed no significant difference from controls. Only those mice given (5) showed greater resistance than controls. C. A. K.

Therapeutic activity of aromatic sulphur compounds in diseases caused by ultra-viruses. C. LEVADITI (Compt. rend. Soc. Biol., 1938, 127, 958–960).—Aromatic S compounds containing sulphonamide, sulphone, or sulfoxide groups are therapeutically active in experimental streptococci, meningococcal, pneumococcal, and gonococcal infections but are valueless in diseases caused by neurotropic ultra-viruses. H. G. R.

Clinical experience with sulphanilamide in the treatment of beta-hæmolytic streptococcal infections. P. O. HAGEMAN and F. G. BLAKE (Amer. J. Med. Sci., 1938, 195, 163–175).—144 consecutive cases of beta-hæmolytic streptococcal infection were treated with sulphanilamide. The conditions treated included erysipelas, pneumonia, meningitis, mastoiditis, and otitis media, and the results obtained indicated that sulphanilamide modified the course of infection in most cases. 49.1% of cases exhibited toxic effects due to the drug, the most frequent being cyanosis in 44.7%. R. L. N.

Toxic action of uliron. H. E. EULER (Münch. med. Wschr., 1938, 85, 623–625).—A case is reported in which oral administration of 36 g. uliron in the treatment of gonorrhœa produced leucopenia, severe dermatitis, and death of the patient. A. S.

Neuritis following administration of uliron. R. LEMKE (Münch. med. Wschr., 1938, 85, 452–453).—Several cases of neuritis of the sciatic and of the peroneal nerves were observed following administration of large doses of uliron during the treatment of gonorrhœa. A. S.

History of early antiseptics. M. F. W. DUNKER (J. Chem. Educ., 1938, 15, 58–61). L. S. T.

Biological properties of organic guaiacolsulphonates. S. OTOLSKI (Arch. Chem. Farm., 1937, 3, 260–269).—The mono-, di-, and tri-ethylamine, ethylenediamine, and piperazine salts of guaiacolsulphonic acid are less toxic than, and as active therapeutically as, the K salt; they may be administered orally. The physiological action of the piperidine, ephedrine, and O-methyltyramine salts does not differ from that of other salts of these bases. R. T.

Content of micro-organisms in chemicals used in injection. V. RIBER (Dansk Tidsskr. Farm., 1938, 12, 81–93).—251 samples of chemicals used for injection were examined for micro-organisms. Bacteria, yeasts, or moulds were found in 45.4% of the samples, their occurrence being independent of the toxicity or bactericidal properties of the substances. The presence of the micro-organisms is due to contamination with dust. As only 5% of the organisms found are sporiferous, solutions prepared from such

chemicals can be safely sterilised by heating for 2 hr. at 80°. M. H. M. A.

Synthesis in the acridine series. I. C. FELDMAN and E. L. KOPELIOVITSCH (Prom. Org. Chim., 1936, 1, No. 1, 31—33; cf. A., 1936, 84).—8-Chloro-5-(diethylamino- α -methylbutylamino)-3-methoxy-, 8-chloro-5-(diethylaminopropylamino)-3-methoxy-, and 7 : 8-dichloro-5-(diethylamino- α -methylbutylamino)-3-methoxy-acridine, prepared by the methods of Magidson and Grigorovski (cf. B., 1934, 525), are less effective as antimalarials than atabrin. CH. ABS. (c)

Medicinal products from acridine compounds. Effect of changing substituents in positions 3 and 8 or of changing the amine in the side chain, on the antimalarial activity.—See A., 1938, II, 246.

Chemotherapeutic studies in the acridine series. Relation between chemical constitution and biological action in simple aminoacridines. A. ALBERT, A. E. FRANCIS, L. P. GARROD, and W. H. LINNELL (Brit. J. Exp. Path., 1938, 19, 41—52).—The chemical properties and synthesis of 10 aminoacridine derivatives (see A., 1936, 343; 1937, II, 33; 1938, II, 112; III, 325) are redescribed. Bacteriostatic action was tested on *Strept. pyogenes*, *Staph. aureus*, *Bact. coli*, and *Ps. pyocyanea*; the bactericidal action of some was determined on *S. pyogenes*, proflavine being used as the control substance. *S. pyogenes* was the most susceptible but *P. pyocyanea* was entirely insusceptible to the action of these compounds. 1-Aminoacridines were all devoid of antiseptic activity, even though a strongly acting antiseptic substituent, such as the 2-amino-group, was present also. They showed a comparatively low mammalian toxicity provided two amino-groups were not in the same ring. The 2-amino-group introduced marked antiseptic properties, which were further developed by the addition (in another ring) of a 2-, 3-, 4-, or 5-amino-group. This led to increased toxicity only when the added substituent was a 2-amino-group (giving proflavine; 2 : 8-diaminoacridine). Acetylation of one amino-group in the latter compound led again to loss of activity, but the effect produced was qualitatively distinct from that of the monoamino-compound, in that the latter was depressed by serum, whereas the former was increased thereby. 3 : 8- (2 : 7-) Diaminoacridine was approx. equal to proflavine in bactericidal activity but possessed a much lower mammalian toxicity. When more than one 3-amino-group was present (as in 3 : 7-diaminoacridine) the activity decreased. 4 : 8- (2 : 6-) Diaminoacridine showed considerable activity. 5-Aminoacridines displayed high antiseptic activity, particularly against streptococci; 2-chloro-5-aminoacridine was the most active, but its mammalian toxicity was increased in like proportion. The acridone nucleus did not share the antiseptic properties of the acridine nucleus. Toxicity determined by the lethal dose for mice and by the max. concn. tolerated by human leucocytes gave divergent results. R. L. N.

Syntheses of antimalarial lupinine derivatives.—See A., 1938, II, 250.

Study of the therapeutics and prophylaxis of malaria by synthetic drugs as compared with quinine. MALARIA COMMISSION OF THE LEAGUE OF NATIONS HEALTH ORGANISATION (Amer. J. Hyg., 1938, 27, 390—398).—Conclusions of the "Fourth General Report of the Malarial Commission" are given. G. P. G.

In vitro photodynamic action of methylene-blue on *Trypanosoma brucei*. T. T'UNG (Proc. Soc. Exp. Biol. Med., 1938, 38, 29—31).—Methylene-blue, 1 : 100,000, together with illumination with a 100-watt lamp at 10 cm., was as effective in killing this organism as a 1 : 100 solution in the dark. The cellular structure is better preserved than with other trypanocidal agents. V. J. W.

Chemotherapeutic action of synthalin in experimental infections with *T. brucei* and *T. congolense*. P. BROWNING (J. Path. Bact., 1938, 46, 323—329).—Decamethylenediguanidine hydrochloride (synthalin) has a chemotherapeutic action on mice infected with *T. brucei* even on arsacetin-resistant strains, whilst infections with two different strains of *T. congolense* were also influenced. Relapses occurred with daily injections. Mice infected with *T. congolense* showed slight hypoglycæmia to the same degree as in uninfected mice treated with synthalin and guanidine; as only the former drug has a therapeutic action the action is not exclusively due to the effect on blood-sugar. W. L. D.

Effect of arsenic on carbohydrate metabolism. H. A. OELKERS (Klin. Woch., 1937, 16, 1204—1205).—Intravenous As in toxic doses delays the return of the blood-sugar to normal level after glucose administration in rabbits. Adrenaline hyperglycæmia lasts longer and the action of insulin is retarded. F. W. L.

Azo dyes and immunobiology. "Diazotisation" of salvarsan.—See A., 1938, II, 208.

Constitution and action of aromatic arsenic acids.—See A., 1938, II, 250.

Therapeutic efficiency of Bismarsen in experimental syphilis in rabbits : comparison with arsenamine. G. W. RAIZISS and M. SEVERAC (J. Chemotherap., 1936, 12, 321—329).—Tolerance limits and sterilising dosages are compared. CH. ABS. (p)

Local quinine therapy for diseases of conjunctiva and cornea. E. SELINGER (Arch. Ophthalmol., 1936, 15, 31—35).—The action of quinine depends on its penetration of mucous membranes and its effect, as a protoplasmic poison, in destroying cellular elements. CH. ABS. (p)

Behaviour of *Paramecium caudatum* in quinine solutions. M. CHEFFEC (Acta Biol. Exp., 1937, 11, 220—228).—Gradual addition of quinine to the culture medium results in acquisition of tolerance, the ciliates developing normally in 0.00125% quinine sulphate, which is toxic to unaccustomed organisms. Fed specimens are more resistant than starved ones. The acquired tolerance is not permanent, being abolished by transference to ordinary media for 70 hr. The ciliates do not metabolise quinine. R. T.

Intestinal protozoa and effects of aldarson on *Giardia* and other intestinal protozoa of man. V. ARMAGHAN and G. C. MEDIARY (Amer. J. Hyg., 1938, 27, 250—257).—Aldarson (3-amino-4-hydroxy-phenylarsinic acid), administered over a period of 2 days to 30 cases harbouring *Giardia* and other intestinal protozoa, eliminated 65% of *Giardia* infections, 100% of infections with *E. coli*, *C. mesnili*, *E. nana*, and *I. williamsi*, 86% of *T. hominis*, and 33% of *E. histolytica*. The cases ranged from 4 to 60 years and were living under uniformly sanitary conditions and were having the same diet. G. P. G.

Control of streptococcal mastitis by curative and preventive vaccination and some hygienic methods. E. BROCHU, M. PANISSET, and M. VEILLEUX (Lait, 1938, 18, 131—145, 243—257).—Various methods of treatment, including use of acridine derivatives, udder irrigation, and external treatments, are discussed. W. L. D.

Sdt. 561 in the treatment of kala-azar. T. M. YATES (Chinese Med. J., 1937, 52, 339—344).—82 cases of kala-azar treated with Sdt. 561 (Solustibosan) showed only 5% mortality. This compared favourably with the Sb prep. previously used. Owing to its relative non-toxicity the whole dosage could be given in 5 days. P. C. W.

Therapeutic action of digitalis preparations on isolated frog heart. T. TAKESAKI (Fukuoka Acta med., 1938, 31, 20—24).—The therapeutic action of digitoxin, infusion of digitalis leaves, and ouabain, investigated on the isolated frog heart perfused with Ringer's solution with a low Ca/K ratio, consists of a strengthening of the ventricular contraction and a decrease in the vol. of the ventricles, which abolishes the relative insufficiency of the auriculo-ventricular valves. A method of assay is described, in which the therapeutic action of the drug is used. W. D'A. M.

Spasms of the arteries produced by digitalis. E. SCHILL (Wien. Arch. inn. Med., 1938, 32, 1—6).—Local vasoconstriction was observed in several cases treated over long periods with digitalis. The main symptoms were intermittent claudication, pallor of the skin, and diminution of urine secretion. The symptoms disappeared when the administration of digitalis was stopped. A. S.

Seasonal variation of effective value of digitalis preparations for *Rana tigerina*. B. KO (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 185—186).—Seasonal variations range from 1.3 to 3.4. Similar fluctuations occur with digifolin and helleborein. CH. ABS. (p)

Mechanism of the diuretic action of digitalis. II. **Diuretic action of digitoflavone glucoside, quercetin, and lutein.** I. MATSUYAMA (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 186—189; cf. A., 1936, 1145).—Digitoflavone glucoside and its aglucone were equally potent as diuretics. The action of lutein was greater than that of quercetin. CH. ABS. (p)

Effect of various drugs on action of digitalis. B. NUKI (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 189—190).—Saponin,

KCl, MgCl₂, and MgSO₄ prolonged whereas CaCl₂ shortened the assay period of digitalis by the Focke and intravenous methods. CH. ABS. (p)

Relation between the lethal dose of digitalis preparations and observation time. B. NUKI (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 191).—The min. period of observation for digitalis assays is 2 hr., and for ouabain 4 hr. CH. ABS. (p)

Evaluation of digitalis leaves and their preparation. K. TOKITA (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 191—194).—Repeated injections are made until cardiac arrest is observed in exposed hearts of urethane-anæsthetised rabbits. Vals. for various preps. are recorded. CH. ABS. (p)

Action of digitalis on the heart. I. Relation between activity and toxicity of leaf in connexion with deterioration. K. TAMURA, Y. KOBAYASHI, and K. TOKITA (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 194—197).—Data for leaf extracts of *Digitalis purpurea* and *D. lanata* are given, the former having the greater tonic but the smaller toxic action. After storage for one month the tonic effect (guinea-pig, rabbit) was lost but the toxic action (cat) was unchanged. CH. ABS. (p)

Cumulative action of drugs of the *Digitalis* group. T. FUKUDA and T. MATSUI (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 197—198).—Subcutaneous injection of ouabain increased the resistance of the frog heart to digitalis perfusion. Chloral hydrate sensitised the response. CH. ABS. (p)

Assay of digitalis preparations. T. FUKUDA and M. TAMAKI (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 198—201).—With a modified Langendorff method, no relation was apparent between the concn. of digitalis causing increased amplitude of heart beat, and the concn. producing cardiac arrest. CH. ABS. (p)

Pharmacological and clinical observations on the use of small doses of digitalis-quinidine-iodine. H. SEEL (Dtsch. med. Wschr., 1938, 64, 444—446).—Arteriosclerotic patients with cardiac insufficiency and disturbances of heart conductivity were successfully given over many weeks a prep. containing 0.017 g. of digitalis tincture, 0.033 g. of quinidine sulphate, 0.01 g. of papaverine dipropylbarbiturate, 0.07 g. of iodine, and 0.03 g. of extract of valerian. A. S.

Effect of experimental cardiac infarction on response to digitalis. J. TRAVELL, H. GOLD, and W. MODELL (Arch. Int. Med., 1938, 61, 184—197).—Cats with a partly healed infarct resulting from ligation of a coronary vessel 3 weeks previously required only about $\frac{3}{4}$ as much digitalis as the normal animal to cause ventricular ectopic rhythm and death. The larger the infarct the more susceptible the animal. Digitalis displaces the *RT* segment in the electrocardiogram more readily in animals with cardiac infarction. Treatment with aminophylline did not affect the tolerance to digitalis. T. H. H.

Influence of strophanthin on the electrocardiogram. W. HADORN and W. FREY (Cardiologia, 1938, 2, 87—106).—Intravenous injection of 0.5—1 mg. of strophanthin into rabbits may produce extrasystoles, auriculo-ventricular block, ventricular flutter or fibrillation, change of the *S-T* interval, and flattened, diphasic or negative *T* in one or more leads. The lethal dose was 0.4 mg. per kg. body-wt. injected over 10 min. A. S.

Influence of hormones on the cardiac action of *g*-strophanthin (Merck). M. TERASAKA (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 8, 183—184).—In frog hearts perfused with ouabain (10 mg. per l.), addition of thyroxine to the perfusion liquid increased the toxic effect; addition of insulin (or, to a smaller extent, of pituitrin) strengthened the beat. Administration of thyroxine prior to perfusion produced no effect.

CH. ABS. (p)

Relation between administration of Helborsid and strophanthin. O. VON ZIMMERMANN-MEINZINGEN and D. CICOVACKI (Münch. med. Wschr., 1938, 85, 505—509).—Intravenous injections of 0.2—0.5 mg. of Helborsid "Roche," a prep. obtained from *Helleborus niger*, are as useful in cases of heart failure as strophanthin. Dosage, route, and indications for administration correspond with those for strophanthin. A. S.

Action of veritol on the circulation. H. MÜGGE (Klin. Woch., 1937, 16, 1241—1243).—The amount of veritol (*p*-hydroxyphenylisopropylmethylamine) required to produce in spinal cats, with vagi cut, similar increases in arterial pressure was 25—30 times that of adrenaline, but the effect lasted longer. The ratio for transfusion of the vessels of the rabbit's ear was 500 : 1. In some experiments tachyphylaxis was observed. It produced increased minute vol. and coronary flow in hearts hypodynamic from pernocton. F. W. L.

Action of veritol on the circulation of healthy subjects. F. MEYER and W. SPIEGELHOFF (Klin. Woch., 1937, 16, 1342—1345).—Veritol doubles the stroke vol., slows the heart rate, and raises the arterial blood pressure. F. W. L.

Action of sympatol on blood pressure. Y. TAKAYA (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 147—148).—Sympatol has a less intense but more prolonged action than adrenaline. CH. ABS. (p)

Circulatory action of sympatol in healthy adults. G. BUDELMANN (Klin. Woch., 1937, 16, 1270—1272).—Small doses have no action; average therapeutic doses increase, but large doses decrease, the vital capacity. This diminution is similar to that produced by adrenaline. The increase is due to the presence of less blood in the pulmonary circulation. F. W. L.

Effect of thionin in heart failure. A. REUTER and B. PFALLER (Dtsch. med. Wschr., 1938, 64, 438—440).—Intravenous injection of 5—10 c.c. of 0.2% solution of thionin has no effect on O₂ consumption and blood-lactic acid of normal subjects. O O (A., III.)

It reduces O₂ consumption and the increased blood-lactic acid in cases of congestive heart failure.

A. S.

Analysis of the circulatory actions of ethylnorsuprarenin. W. M. CAMERON, J. M. CRISMON, L. J. WHITSELL, and M. L. TANTER (J. Pharm. Exp. Ther., 1938, 62, 318—332).—Ethylnorsuprarenin (β -amino- α -3 : 4-dihydroxyphenylbutanol), in doses of 0.1 to 1.0 mg. per kg., causes a characteristic fall of arterial pressure in anaesthetised cats. It increases cardiac output in heart-lung preps., causes vasoconstriction in perfused legs, and constricts excised hepatic veins. Changes in caval and portal pressures, and liver and intestinal vols., in the intact animal, associate the depressor effect with contraction of the hepatic veins, pooling of blood in the splanchnic area, and decreased venous return to the heart.

E. M. S.

Cardiac and hæmodynamic action of fagarine I. E. MOISSET DE ESPANÉS and B. MOYANO NAVARRO (Compt. rend. Soc. Biol., 1938, 127, 510—512).—In dogs the heart is inhibited; small doses raise and large lower the blood pressure. D. N.

Action of fagarine I on the isolated frog's heart. E. MOISSET DE ESPANÉS (Compt. rend. Soc. Biol., 1938, 127, 512—514).—Inhibition is produced, which is abolished by washing. The effects are not modified by atropine, acetylcholine, eserine, and pilocarpine. When the heart is arrested by the drug, adrenaline but not Ba will restore rhythmic cardiac activity. D. N.

Cardio-vascular stimulants. OURY, BESSON, and BOUCHARA (Presse méd., 1938, 154—156).—Experiments on rabbits, dogs, and patients show that a mixture of camphramine (β -diethylcarboxylamide of camphorsulphonyl-*N*-methylpyridine) and presse-drine (racemic ψ -norephedrine) is effective orally and parenterally, acting directly on the heart, vessels, and respiratory centre. P. C. W.

Effects of cycliton in surgical practice. H. MÜNCH (Dtsch. med. Wschr., 1938, 64, 605—607).—Intravenous injections of cycliton (3 : 5-dimethylisoxazole-4-carboxyldiethylamide) produce satisfactory results in surgical collapse and respiratory failure. A. S.

Pharmacology of lymph hearts. III. H. WAKAI and M. YAMAKOSHI (Folia Pharmacol. Japon., 1936, 21, 284—291).—Adrenaline, atropine, pilocarpine, and eserine depress lymph hearts, the action resembling that on blood hearts. Atropine is less antagonistic to adrenaline on the lymph than on the blood heart. Digalen, *g*- and *k*-strophanthin, and coramine markedly affect both hearts.

CH. ABS. (p)

Action of aromatic constituents of raw leaves of *Thea sinensis japonica* on isolated frog heart. I. Action of $\beta\gamma$ -hexenol, $\alpha\beta$ -hexenal, and hexyl alcohol. II. Action of the aromatic ethereal alcohol of leaves and of lower aldehydes contained therein. S. MURAKAMI (Folia Pharmacol. Japon., 1936, 21, 273—283, 359—372).—I. All three substances weakened the heart.

II. Fractions boiling up to 100° stimulated and those boiling at 100—160° depressed the heart.

Butyl and isobutyl alcohols weakened the heart but increased tonus. Methylethylacetaldehyde had a smaller and isovaleraldehyde no action. In all cases large doses caused systolic arrest. The lower aldehyde content of the oil explains much of its action on the heart.

CH. ABS. (p)

Cardiostimulant effect of Japanese camphor : a transformation product, *d-trans*-7-aldehydo- π -apocamphor, as the true active substance. K. TAMURA, G. KIHARA, and M. ISHIDATE (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 172—177).—Camphor and its oxidation products are inert or have a depressant action on the heart, with the exception of *d-trans*-7-aldehydo- π -apocamphor, which is a stimulant.

CH. ABS. (p)

Diuretic effect of esidron in cardiac oedema. W. STAHEL (Schweiz. med. Wschr., 1938, 68, 314—315).—Intramuscular or intravenous injections of Esidron—"Ciba" (Na salt of quinolinic acid hydroxypropylamide-Hg-theophylline) have a strong diuretic effect in cases of cardiac oedema.

A. S.

Treatment of cardiac asthma and angina pectoris. H. SIEDECK (Wien. med. Wschr., 1938, 88, 408—411).—A review.

A. S.

Changes in arterial blood pressure and blood-sugar due to administration of β -phenylisopropylamine. G. CAIZZONE (Arch. Farm. sperim., 1938, 65, 96—101).—The drug resembles adrenaline and ephedrine in its action (in man) of increasing erythrocyte count, blood pressure, pulse rate, respiration, and blood-sugar, but differs in its action on the leucocytes which (especially the lymphocytes) are also significantly increased.

F. O. H.

Excessive hyperpyrexia following hot baths given to produce hyperpyrexia by hydrotherapy. H. LOWENBURG, sen. (Arch. Pediat., 1938, 55, 91—93).—A case of chorea was successfully treated by repeated baths at a temp. of 90° F. rising to 120° F. for 2—3 hr. On 2 occasions the rectal temp. rose to 108° F., the patient became unconscious and rigid, and showed generalised twitchings. Cooling the bath caused rapid recovery.

C. J. C. B.

Follow up report of 99 children who received fever therapy for chorea. L. P. SUTTON and K. G. DODGE (J. Pediat., 1938, 12, 490—492).—In children treated by fever therapy and observed for 1—3 years 12.5% showed signs of and 2.8% died from heart disease compared with 26% and 13% respectively in those treated by other methods. In cases observed for 4—6 years, 29.4% of the fever-treated and 35% of the other group showed heart disease, while 1.96% and 10.8% respectively died from this cause.

C. J. C. B.

Death of a child following artificial fever therapy. E. FRIEDMAN and C. J. STETTHEIMER (J. Pediat., 1938, 12, 514—516).—A child aged 2½ with gonococcal urethritis suddenly became cyanotic, with rapid respiration and circulatory collapse, 3 hr. after heat therapy with a General Electric Inductotherm. The temp. was then 108° F. but after sponging and other measures, fell to 104° and then continued falling despite all measures, to 94° at death 5½ hr. after the first onset of symptoms. Death was attri-

buted to circulatory failure and exhaustion of the heat regulating centre.

C. J. C. B.

Clinical study of rheumatic fever with special reference to salysal therapy. H. R. LITCHFIELD (Arch. Pediat., 1938, 54, 135—142).—Salysal (salicyl salicylate) was effective in 20 children, and as it is almost tasteless it is preferable to Na salicylate for children. The temp. subsides more slowly and diaphoresis is not so marked but the analgesic effect is marked and few patients need any additional sedatives for pain and restlessness.

C. J. C. B.

Fever therapy in the treatment of acute rheumatic fever. F. L. DUNN and E. E. SIMMONS (Ann. intern. Med., 1938, 11, 1600—1606).—15 cases of acute rheumatic fever were treated with the Kettering hypertherm cabinet for periods of 8½ to 46 hr. at temp. of 103—106° F. 13 cases showed complete relief from joint pain and swelling; 3 cases recurred within 2 weeks to 21 months.

C. A. K.

Recovery from gonorrhoeal endocarditis after artificial hyperpyrexia. H. A. FREUND, W. L. ANDERSON, and V. S. LILLY (J. Amer. Med. Assoc., 1938, 110, 549—552).—A case of gonorrhoeal endocarditis was successfully treated by artificial fever therapy.

R. L. N.

Positive inotropic effect of choline derivatives on auricular strips of the heart in mammals. C. J. ROTHBERGER and A. SACHS (Cardiologia, 1938, 2, 71—86).—Minute doses of acetylcholine and carbamylcholine chloride (Doryl) may increase the power of contractions of isolated auricular strips of the rabbit's heart. A slight increase of the dose will produce the usual diminution of the contractions. Both positive and negative inotropic effects are reversible on washing and can be abolished by atropine.

A. S.

Tonotropic action of acetylcholine on the auricle of the terrapin (*Pseudomys elegans*). A. M. LANDS (Proc. Soc. Exp. Biol. Med., 1938, 38, 48—50).—The addition of acetylcholine to the bath in which the auricular muscle was suspended caused a cessation of beats and an increase of tone to an extent greater than the previous systole. The concn. necessary varied between 1:1000 and 1:50,000 in different specimens. This effect on tonus was prevented by atropine or adrenaline. A similar effect is produced by K salts. This is not affected by atropine, but is prevented by adrenaline.

V. J. W.

Alleged effect of acetylcholine on immobilised joints. A. M. HARVEY (Brit. Med. J., 1938, I, 835—836).—Subcutaneous injection of acetylcholine does not prevent the ankylosis and muscular atrophy which follow immobilisation of the hind-limb joints of rabbits, contrary to the recent claims of Neuburger and Scholl (A., 1938, III, 226).

C. A. K.

Acetylcholine in the cure of post-operative intestinal paresis. P. C. BORSOTTI (Minerva med., 1936, I, 133—134).

CH. ABS. (p)

Reciprocal antagonism between eserine and curare. J. FEGLER and H. KOWARZYK (Compt. rend. Soc. Biol., 1938, 127, 1149—1152).—The reciprocal antagonism between eserine and curare is

explained by their effects on the acetylcholine-choline-esterase system. H. G. R.

Influence of eserine on adreno-secretory action of potassium. H. HERMANN, F. JOURDAN, G. MORIN, and J. VIAL (Compt. rend. Soc. Biol., 1938, 127, 613—616).—Eserine potentiates this action of K on the acutely denervated adrenal medulla. D. N.

Cerebral damage in a case of fatal poisoning due to a compound of ergot and apiol (Ergo-apiol). K. LOWENBERG (J. Amer. Med. Assoc., 1938, 110, 573—575). R. L. N.

Pharmacological action of deuterium oxide. V. A calorigenic saturation level and the influence of ergotoxine. H. G. BARBOUR and L. E. RICE (J. Pharm. Exp. Ther., 1938, 62, 292—300; cf. A., 1938, III, 327).—The metabolic rate of mice was definitely increased by bringing the body-water to one fifth saturation with D₂O. Ergotoxine reduced the effect, thus affording further evidence of the sympathomimetic action of D₂O. E. M. S.

Cumulative action of ergotoxine. D. IFUKU (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 148—150).—Injection of ergotoxine (0.01—0.2 mg.) diminished the intensity of the adrenaline response in rabbits. With daily injections of 0.1 mg. the intensity of response increased and the duration shortened. CH. ABS. (p)

Influence of ergotamine, ergotoxine, yohimbine, quinine, and hydrastine on glycogen mobilisation and vessel action produced in the toad liver by adrenaline. H. YOKOYAMA (Folia Pharmacol. Japon., 1936, 21, 336—346).—All the drugs completely inhibit the constrictor action of adrenaline. CH. ABS. (p)

Standardisation of ergot. Comparison of results obtained by the colorimetric, cock's comb, and Broom-Clark methods of assay. A. N. STEVENS (J. Amer. Pharm. Assoc., 1938, 27, 100—103).—The cock's comb method of the U.S.P. XI determines only those alkaloids in fluid extract of ergot which are sparingly sol. in water. Comparative results for the above methods are tabulated and a colorimetric method (a modification of Allport and Cocking's, B., 1932, 1135) is described. F. O. H.

Chronic alcoholism. M. NEYMARK and E. M. P. WIDMARK (Compt. rend. Trav. Lab. Carlsberg, 1938, 22, 375—383; cf. A., 1934, 803).—Approx. 33 kg. of alcohol was fed to each of two dogs over a period of 2.5 years, one dog receiving alcohol with its food, whilst the other received it on an empty stomach. Both dogs decreased in wt. at first, but afterwards there was a progressive increase to the end of the period. No difference was noticed in alcohol distribution in the dogs. They showed symptoms of alcohol intoxication. The effect of proteins and amino-acids in decreasing absorption of alcohol was not seen in the case of the dog receiving alcohol fasting, whilst in the case of the other, the effect was less pronounced and irregular. J. N. A.

Nature of acquired tolerance to alcohol. H. W. NEWMAN and A. J. LEHMAN (J. Pharm. Exp. Ther., 1938, 62, 301—306).—5 dogs were given test doses

of ethyl alcohol before and after 97 days' habituation. Neuromuscular co-ordination, at a given blood-alcohol level, was better after habituation than before; there was no significant change in the rate of alcohol metabolism. Brains of habituated rats were more permeable to alcohol than those of controls. Thus acquired tolerance is due to development of cellular tolerance by the nervous system, rather than to change in rate of absorption or elimination of alcohol. E. M. S.

Alcoholic intoxication. S. SELESNICK (J. Amer. Med. Assoc., 1938, 110, 775—778).—A review. The determination of blood-alcohol is the most definite criterion in the diagnosis of alcoholic intoxication. R. L. N.

Rapid chemical test for intoxication employing breath. R. N. HARGER, E. B. LAMB, and H. R. HULPIEU (J. Amer. Med. Assoc., 1938, 110, 779—785).—A method, using a reagent of 55% H₂SO₄ and KMnO₄, which reacts rapidly and quantitatively with alcohol but is not affected by acetone, was used to determine alcohol in the breath. From the ratio of alcohol to CO₂ in the breath the concn. of alcohol in the blood is determined. In 121 subjects the wt. of alcohol accompanying 190 mg. of CO₂ in the breath was approx. equal to the wt. of alcohol in 1 c.c. of the subject's blood. R. L. N.

Remissions of attacks in epilepsy treated with sodium bromide. L. J. POLLOCK (J. Amer. Med. Assoc., 1938, 110, 632—634).—An analysis of the results of NaBr therapy in a series of cases of epilepsy. R. L. N.

Pharmacological action of acetyl brovarin. K. MINOSHIMA (Folia Pharmacol. Japon., 1938, 25, 33—34).—Acetyl brovarin (acetyl- α -bromoisovaleryl-urea) is a mild hypnotic in doses of 0.15—0.2 g. per kg. body-wt. in rabbits. Concns. of 0.6 g. per kg. produce anaesthesia. The lethal dose in rabbits is 1.6 g. per kg. A. S.

Substituted tetrahydronaphthalenes.—See A., 1938, II, 235.

A new hypnotic. T. MARTI (Schweiz. med. Wschr., 1938, 68, 382—384).—Caponal ("Pola"), a combination of dehydrocholic acid with 32.6% of phenylethylbarbituric acid, is a useful hypnotic. A. S.

Withdrawal symptoms in cultures of fibroblasts accustomed to heroin. K. MIZUGAKI (Folia Pharmacol. Japon., 1938, 25, 32—33).—If heroin is added for a long period to cultures of chick heart fibroblasts, the tissue acquires a tolerance to increasing concns. of the drug. If heroin is suddenly withdrawn from cultures accustomed to it, tissue growth stops and severe degenerative changes develop. A. S.

Addition of cultures *in vitro* of iris epithelium to ethyl alcohol and its abstinence phenomena in the tissue. M. MAEDA (Folia Pharmacol. Japon., 1938, 25, 11—23).—High concns. of ethyl, *n*-propyl, and *n*-butyl alcohol inhibit, low concns. stimulate, the growth *in vitro* of cultures of iris epithelium. The tolerance of the cultures to ethyl alcohol increases considerably if the alcohol is added for a long time to

the culture media. Tissue cultures adapted to ethyl alcohol show degenerative changes and cessation of growth if the alcohol is suddenly withheld. Recovery always occurs. The tolerance acquired towards ethyl alcohol is non-sp., as the same cultures are also tolerant towards propyl and butyl alcohol. A. S.

Effect of (A) hypnotics, (B) abnormal blood pressure, on iodine excretion by the kidney. H. ITO (*Folia Pharmacol. Japon.*, 1936, 21, 239—251, 252—261).—(A) Following injection of NaI into rabbits, urethane, chloral hydrate, and Na phenobarbital diminish I excretion to an extent related to the diminution of blood pressure.

(B) Lowering the blood pressure by acetylcholine or NaNO_2 after NaI injection decreased excretion of urine and of I. Adrenaline and ephedrine produced the reverse effects. CH. ABS. (p)

Case of eukodalism. A. LEISCHNER (*Nervenarzt*, 1938, 11, 121—127).—The effects of 4 years' administration of Eukodal (chloral hydrate-dihydroxycodine) to a man aged 31 are described. Sudden withdrawal of the drug produced very little reaction, and after one week all the psychological changes had disappeared. C. A. K.

Physical-chemical properties and local anaesthetising action. Relative fat solubility, surface tension, and colloid coagulation by amino-ethers of *p*-hydroxybenzoic esters. C. ROHMANN and A. KOCH (*Arch. Pharm.*, 1938, 276, 189—198).—Determination of the partition coeff. between olive oil and water of a homologous series of amino-ethers of *p*-hydroxybenzoic esters shows a relationship between fat-solubility and local anaesthetic action; marked differences arise when the comparison is extended to other differently constituted but similarly active materials (novocaine, tutocaine, cocaine, pantocaine). Among the esters the limiting concn. for coagulation of colloid diminishes with physiological activity. The comparison materials show little uniformity among themselves and when attempts are made to bring them into relation with the esters there appears to be no parallelism with the active concns. A comparison between surface tension and activity appears possible only in the two homologous series. The greater is the surface activity of the homologue, the greater is its anaesthetising action. Outside these two series the differences are such that only an approx. evaluation is possible. H. W.

Do cocaine and local anaesthetics of the cocaine group sensitise the uterus and intestine to adrenaline? Y. HIGUCHI (*Folia Pharmacol. Japon.*, 1936, 21, 262—272).—Cocaine caused sensitisation, alpine had very slight, and procaine, nupercaine, and tutocaine had no, action. Tropacocaine probably weakened the adrenaline action slightly.

CH. ABS. (p)

Prolongation of cocaine anaesthesia of the cornea by simultaneous administration of cocaine, morphine, and egg-white. A. STEPHANY and G. MATSCHULAN (*Arch. exp. Path. Pharm.*, 1937, 187, 234—236).—Cocaine (2 drops of a 2% solution) introduced into the conjunctival sac anaesthetised the cornea for 30 min.; given with mor-

phine (subcutaneously) or egg-white (into the conjunctival sac) it acted for 1—1½ hr., and with both morphine and egg-white for 9—13 hr. I. S.

Recent advances in anaesthesia. J. S. LUNDY (*J. Amer. Med. Assoc.*, 1938, 110, 434—436).—A discussion of the more recent methods of anaesthesia. R. L. N.

New anaesthetic [*p*-aminobenzoyl ester of *NN'N'*-triethyl-*N*- β -hydroxyethylethylenediamine].—See A., 1938, II, 233.

Problems of narcosis with liquid substances. H. WESE (*Klin. Woch.*, 1937, 16, 1297—1302).—A review. F. W. L.

Survey of modern anaesthetics. N. L. ALLPORT (*Ind. Chem.*, 1938, 14, 115—117, 187—190, 192).

Trend of modern anaesthesia for upper abdominal surgery. H. K. ASHWORTH (*Proc. Roy. Soc. Med.*, 1938, 31, 446—450).—Production of anaesthesia by (1) local infiltration, (2) basal narcosis, combined with N_2O and O_2 plus minimal ether or vinesthene for short periods, (3) spinal anaesthesia, and (4) basal anaesthesia plus cyclopropane, for the purpose of emergency and "quiet" upper abdominal surgery is described. The merits of each method and their applicability are discussed. W. J. G.

Homologues of cyclopropane. II. Anaesthetic properties. L. F. SHACKELL (*J. Amer. Pharm. Assoc.*, 1938, 27, 128—130; cf. A., 1938, II, 224).—In their anaesthetic action on monkeys, methylcyclopropane is inferior to cyclopropane, mainly due to the side reactions of the former. F. O. H.

Continuous-flow administration of cyclopropane. L. H. MORRIS (*Proc. Roy. Soc. Med.*, 1938, 31, 445—446).—An upright rod provided with a foot-piece carries 3 yokes to take N_2O , O_2 , and cyclopropane cylinders. Flows are measured by pressure gauges having fixed restriction valves at their outlets. A disadvantage of this method is that the rate of flow gradually decreases and does not agree with the dial reading. A Waters to-and-fro soda-lime canister is used. Manipulation of this apparatus, which is suitable for both light and deep anaesthesia, is described. W. J. G.

Ethyl chloride narcosis in the rabbit. L. EFSKIND (*Beitr. klin. Chir.*, 1938, 167, 251—306).—The chemistry and pharmacology of ethyl chloride, and the various theories of narcosis, are reviewed. Ethyl chloride content was determined in the water, ether-extractable substances and dry residue of blood, cerebrospinal fluid, and various organs in 14 rabbits. All experiments lasted at least 3 hr. and reasons are given for assuming a static equilibrium between the tissues and the gas in the respiratory air. The distribution coeffs. (c.c. gas/100 g. tissues) \div % gas in respired air were: perirenal adipose tissue 19.35—24.75, medulla 3.3—3.72, brain 3.3—3.72, whole animal 2.71—2.98, liver 2.51—3.05, kidney 2.52—3.03, heart 2.26—2.57, blood 2.71—3.12, serum 2.26—2.6, striated muscle, 1.35, and cerebrospinal fluid 1.09—1.21. Henry's law of gas absorption did not hold. The calculated distribution coeffs., assuming that the dry residue fraction absorbs no gas and that the gas in

the other two fractions obeys physico-chemical laws, are very much less than those found, with the exception of perirenal adipose tissue; so dry residue, probably in virtue of its albumin, must absorb the narcotic. The gas content for perirenal tissue with a min. of dry residue agrees well with that calc. for fat and the distribution coeff. fat (adipose tissue)—water (cerebrospinal fluid) *in vivo* agrees well with that found *in vitro*. The narcotic concn., and the fatal concn. of the gas with O₂ and with air were found with the corresponding gas concns. in brain and blood. The course of ethyl chloride narcosis is described.

H. B. C.

Effects of sodium evipan on blood-sugar in rabbits. S. PRASAD and B. B. SEN (Indian Med. Gaz., 1936, 71, 24—25).—Intraperitoneal injection of Na evipan (40—80 mg. per kg.) increased blood-sugar to 9—50% above fasting level, max. vals. being reached in approx. 1 hr.

CH. ABS. (p)

Nembutal anaesthesia. III. The median lethal dose of nembutal (pentobarbital sodium) for young and old rats. E. B. CARMICHAEL (J. Pharm. Exp. Ther., 1938, 62, 284—291).—In a group of 248 rats up to 9 months old, weighing 25—260 g., the median lethal dose (50% deaths) of nembutal was 110—120 mg. per kg. The dose was 85—90 mg. per kg. in a group of 117 rats over 12 months old, weighing 150—315 g. The difference in susceptibility of young and old rats was not associated with any definite difference in the resistance of either sex.

E. M. S.

Barbiturates as safe and efficient anaesthetics in canine surgery. E. E. SWEEBE (J. Amer. Vet. med. Ass., 1938, 45, 145—151).—Nembutal is the most suitable surgical anaesthetic for dogs when given by intravenous injection until a suitable depth of anaesthesia is obtained. For minor surgery, the intravenous injection of pentothal Na is preferred ($\frac{1}{8}$ — $\frac{1}{4}$ grain per lb. body-wt.), anaesthesia lasting 10—15 min.

E. G. W.

Spinal anaesthesia in China (1931—35). M. T. YANG (Chinese Med. J., 1938, 53, 37—46).—11,118 cases collected in response to a questionnaire are analysed and show a mortality rate of 0.063% and failure of anaesthesia in 0.49% of cases.

P. C. W.

N-Aralkylmorpholines.—See A., 1938, II, 249.

Intravenous benzedrine sulphate as an antagonist to intravenous soluble amytal. E. C. REIFENSTEIN, jun., and E. DAVIDOFF (Proc. Soc. Exp. Med. Biol., 1938, 38, 181—184).—Narcosis resulting from 0.5 g. of amytal could be at once terminated by injection of 20—30 mg. of benzedrine, which also raised the blood pressure up to or above the normal level from which it was in most cases depressed by the amytal.

V. J. W.

Action of β -phenylisopropylamine (benzedrine). Psychophysiological observations. E. VON CSINÁDY and Z. DIRNER (Arbeitsphysiol., 1938, 10, 57—66).—Both benzedrine and caffeine act beneficially on certain psychological functions, e.g., learning foreign words, but disadvantageously on others, e.g., concn. of attention. Foreign words learnt two weeks previously without the help of drugs

were better remembered; it is concluded that their use is better avoided.

E. J. W.

Synthesis of hippuric acid in man following intravenous injection of sodium benzoate. A. J. QUICK, H. N. OTTENSTEIN, and H. WELTSCHER (Proc. Soc. Exp. Biol. Med., 1938, 38, 77—78).—If 1.77 g. of Na benzoate dissolved in 20 c.c. of water are given intravenously, 0.7—0.95 g. of hippuric acid is normally excreted during the first hr.

V. J. W.

Mercuri-organic diuretics. M. DOMINIKIEWICZ (Arch. Chem. Farm., 1937, 3, 237—248).—A consideration of the structure of mercurial diuretics leads to the conclusion that their action depends exclusively on the presence of Hg in the *N*-alkyl group of the side-chain of the compounds.

R. T.

Action of fraxinin and other diuretics on the excretion of urine and uric acid. T. OKUI (Tôhoku J. exp. Med., 1938, 32, 225—232).—The cortex of *Fraxinus borealis*, *F. japonica*, and *F. mandshurica* contains fraxin and the glucoside fraxinin. Both substances increase urinary secretion in rabbits; fraxinin has a more prolonged effect. The diuretic action of fraxinin is comparable with that of diuretin; it increases uric acid excretion to about the same extent as atophan.

A. S.

Mechanism of increased uric acid excretion by fraxinin. T. OKUI (Tôhoku J. exp. Med., 1938, 32, 233—238).—Oral administration of 0.5 g. of fraxinin per kg. body-wt. in rabbits increases the excretion of uric acid and of allantoin. The latter effect is attributed to an accelerated transport of allantoin from the tissues into the blood.

A. S.

Osmotic pressure of organs. V. Osmotic pressure of blood and organs following intravenous injection of hypertonic solutions of methyl and ethyl alcohol and glycerol. I. SIMON (Arch. Farm. sperim., 1938, 65, 77—95; cf. A., 1938, III, 145).—The increases (in a few cases, decreases) in osmotic pressure of various organs following injection of various doses of methyl and ethyl alcohol and glycerol into rabbits are tabulated and discussed.

F. O. H.

Alkalosis and the alkaline treatment of peptic ulcer. K. C. WANG (Chinese Med. J., 1938, 53, 23—36).—Alkalosis is a frequent complication following alkaline treatment of peptic ulcer. 104 cases collected from the literature and 19 of the author's show a 6% mortality rate. In 5 advanced cases reported in detail there was impaired renal function, with N retention, decreases blood-Cl', and increased alkaline reserve.

P. C. W.

Relief of diabetic pain of neurocirculatory origin by oral administration of sodium chloride. H. R. SANDSTEAD and A. J. BEAMS (Arch. Int. Med., 1938, 61, 371—380).—After the oral administration of NaCl to 13 diabetic patients, 10 of whom had pain of neuritic and 3 pain of arteriosclerotic origin, there was complete or marked relief of the pain. Improvement in the vascular disease in the patients with arteriosclerotic pain and in the circulation of those with neuritic pain, as shown by the histamine test, followed.

T. H. H.

Therapeutic use of strontium. F. X. GASSMANN (Schweiz. med. Wschr., 1938, 68, 291—292).—Intravenous, intramuscular, or peroral administration of Bromostrontium (NaBr-SrCl₂-urea) is very successful in the treatment of itching diseases of the skin, urticaria, and eczema. A. S.

Comparison of therapeutic calcium salts. II. Minimum lethal dose by intravenous route of calcium camphorsulphonate. U. BALDACCI (Arch. Farm. sperim., 1938, 65, 102—104; cf. A., 1937, III, 63).—The min. lethal dose in rabbits is 0.01 g.-equiv. per kg., i.e., intermediate between CaCl₂ and Ca gluconate. F. O. H.

Action of molybdenum in nutrition of milking cattle. W. S. FERGUSON, A. H. LEWIS, and S. J. WATSON (Nature, 1938, 141, 553).—The deleterious effect which herbage grown on the so-called "teart" areas of Somerset has on milking cattle is connected with the presence of abnormal amounts of Mo in the herbage. Cows fed on a diet including comparable amounts of sol. MoO₄ develop a similar condition. L. S. T.

Effects of mydriatics on intraocular tension. H. S. GRADLE (Amer. J. Ophthalmol., 1936, 19, 37—39).—Among 500 patients treated with homatropine or euphthalmine 2.8% showed increases of intraocular pressure exceeding 5 mm. of Hg under mydriasis. CH. ABS. (p)

Phenolphthalein. B. FANTUS and J. M. DYNIEWICZ (J. Amer. Med. Assoc., 1938, 110, 796—799).—Free phenolphthalein was absent or present in traces in the urine of patients given medicinal doses, but after doses above 240 mg. elimination may be 1 to 2 mg. in 24 hr. Conjugated phenolphthalein was always present in the urine after taking this substance. The total quantity eliminated varied from 2.02 to 17.67 mg. after doses of 60 to 480 mg. The elimination varied from 1.41 to 19.7%. The peak of excretion was usually in 48 hr. and never exceeded 78 hr., and the duration was under 6 days unless there was no cathartic action. R. L. N.

Permeability of the skin to gases and salts from mineral springs. E. BÜRG (Arch. med. Hydrol., Lond., 1938, 16, 35—37).—Evidence is given for the absorption of CO₂ and H₂S through the skin in man. W. F. F.

Influence of allantoin on growth of chicken epithelial cells and chondroblasts in culture. H. J. CHU (Proc. Soc. Exp. Biol. Med., 1938, 38, 99—100).—A slight retardation was produced by concns. of 0.5% and upwards. V. J. W.

Formation of oxalic acid from ethylene glycol and related solvents. F. H. WILEY, W. C. HUEBER, D. S. BERGEN, and F. R. BLOOD (J. Ind. Hyg., 1938, 20, 269—277).—Of seven related compounds injected into dogs and rabbits, only ethylene glycol and its monoacetate produced an increase in urinary oxalic acid, and this increase was too small to account for their toxicity. Ethanolamine was too toxic for more than one injection to be made. All the animals showed degenerative changes of kidney, testes, and brain. There were no oxalic acid deposits in the

renal parenchyma but Ca casts were found in the pyramidal tissue. E. M. W.

Influence of phenol, cresols, resorcinol, quinol, and pyrogallol on growth and histological picture of *in vitro* cultures of iris epithelium. M. MAEDA (Folia Pharmacol. Japon., 1936, 21, 302—308).—Small concns. of the drugs inhibit growth and larger amounts kill the cells. CH. ABS. (p)

Molecular symmetry and toxicity of the isomerides of dichloroethylene. G. B. BONINO and P. MASCHERPA (Arch. Ital. Sci. farm., 1937, Reprint, 22 pp.).—The structure of the isomerides is discussed. Injection and inhalation in frogs, rats, and guinea-pigs indicate an increasing order of toxicity of *trans*-, *cis*-dichloro-, tetrachloro-, trichloro-ethylene, tetrachloroethane. F. O. H.

Relation of liver to detoxication of hydroxybenzoic acids. Y. TSUTSUI (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 114—117).—The min. lethal doses of intravenously injected *o*-, *m*-, and *p*-hydroxybenzoic acids (mice, dogs, rabbits) increased in the order named. Removal of livers only slightly diminished the lethal dosages. CH. ABS. (p)

Rate of absorption from normal and burned areas. E. C. MASON and H. A. SHOEMAKER (Ann. int. Med., 1936, 9, 850—853).—Death occurring after severe burns is due mainly to absorption of protein decomp. products. CH. ABS. (p)

Action of sinomenine hydrochloride on the adrenaline content of the adrenals and of blood in rabbits. S. RIN (Folia Pharmacol. Japon., 1938, 25, 26—27).—Subcutaneous injections of sinomenine hydrochloride diminish the adrenaline content of the adrenal glands in rabbits. A. S.

Potency of periplocymarin, bufotalin, and deacetyloleandrin. K. K. CHEN, R. C. ANDERSON, and E. B. ROBBINS (J. Amer. Pharm. Assoc., 1938, 27, 113—118).—The toxicity and emesis in cats indicate that periplocymarin has a potency equal to that of scillaren-A or coumagine hydrochloride but less than that of convallatoxin, α - and β -antiarrin, ouabain, calotropin, and cymarin. Bufotalin is less potent than areno-, quercico-, gama-, and virido-bufagin but more potent than vulguro-bufotoxin and other bufagins investigated. Deacetylation of oleandrin results in loss of activity. F. O. H.

Medicinal Menispermaceæ of the genera *Tinospora* and *Cocculus*. L. BEAUQUESNE (Bull. Sci. Pharmacol., 1938, 45, 7—14).—The roots of *T. Bakis*, Miers, contain 2—3% of colombine and 0.6% of alkaloids (including palmatine) which have a min. lethal dose of 0.1 g. per kg. in guinea-pigs and significantly decrease blood-pressure (dog) and febrile body-temp. (guinea-pig). The roots of *C. Leaeba* contain colombine (1%), pelosine, palmatine (0.6%), and sangoline (oxycanthine?). The stems of *T. crispa*, Miers, and *T. tuberculata*, Beumée, contain a resinous bitter principle. F. O. H.

Action of intestinal adsorbents on the secretory glands of mice. G. WALLBACH (Arch. Néerland. Physiol., 1938, 22, 567—574).—The effects of croton

oil, castor oil, podophyllin, and K antimonate on the cells of the salivary glands, pancreas, stomach, duodenum and colon were studied by histological examination of these tissues, the drug being given after a week's feeding of bread mixed with one of the following adsorbents: $\text{Al}(\text{OH})_3$, "bolus alba," blood charcoal, or entorbine (composition given). Charcoal had no influence on the appearance of the secreting cells; the $\text{Al}(\text{OH})_3$ and bolus only reduced the responses in certain cases; entorbine stopped the hypersecretion completely. C. E. B.

Vitamin-C and adrenal cortex hormone treatment of diphtheria. E. BERGER (Klin. Woch., 1937, 16, 1177—1180).—No experimental evidence was obtained in guinea-pigs indicating that such treatment was of val. F. W. L.

Toxicity and excretion of verbenalloside. Absence of action on hæmolysis and blood coagulation. J. CHEYMOL (J. Pharm. Chim., 1938, [viii], 27, 325—339).—Verbenalloside is slightly toxic when administered to toads, rabbits, guinea-pigs, and mice. When injected intravenously into dogs, it has no action on the blood-urea or -glucose. It is excreted unchanged in the urine and has no action on hæmolysis or coagulation of blood. T. F. D.

Verbenalloside, a weak parasympathomimetic. J. CHEYMOL (J. Pharm. Chim., 1938, [viii], 27, 374—386).—The glucoside also potentiates the action of acetylcholine. T. F. D.

Action of verbenalloside on isolated organs. J. CHEYMOL (J. Pharm. Chim., 1938, [viii], 27, 386—397).—The action of verbenalloside in increasing the amplitude and regulating the movements of the rabbit's isolated intestine is not due to the sugar moiety of the glucoside. It increases the spontaneous contractions of the guinea-pig's isolated uterus more in the gravid than in the virgin uterus. T. F. D.

Biochemical methods in the assay of centaury (*Erythraea centaurium*). K. KALINOWSKI (J. Pharm. Chim., 1938, [viii], 27, 369—373).—The plant is extracted with boiling abs. alcohol and a little CaCO_3 added. The filtered alcohol extracts are evaporated and dissolved in water, and the resulting solution is treated separately with invertase and emulsin. Emulsin hydrolyses a glucoside erythraurin to glucose and erythrocentaurin, $\text{C}_{10}\text{H}_{16}\text{O}_5$. Hydrolyses in both cases were followed polarimetrically and large differences after hydrolysis were observed in rotation of various samples. T. F. D.

Pharmacology of senso. VI. Y. KOBAYASHI (Japan. J. Med. Sci., IV, 8, No. 3; Proc. Japan. Pharm. Soc., 1935, 9, 179—183).—The min. lethal dose (cat test) of ψ -bufotalin bromide was 24, ψ -bufotalin 0.25, and ouabain 0.1 mg. per kg. The bromide resembles ouabain pharmacologically. CH. ABS. (p)

Insulin treatment of drug addiction. M. P. CHEN, Y. L. CHENG, and R. S. LYMAN (J. Nervous Mental Dis., 1936, 83, 281—288).—Insulin with phenobarbital by creating a craving for food gives relief when habitual use of opiates is prevented. CH. ABS. (p)

Influence of various metal colloids on growth and histological picture of cultivated fibroblast. B. NITTA (Folia Pharmacol. Japon., 1936, 21, 336—346).—Small concns. of colloidal Cu, Ag, Au, Bi, Pt, Fe, Hg, Se, and Sn increase and larger concns. inhibit the growth of fibroblast. The activity of the elements is in the (descending) order named. CH. ABS. (p)

Permeability of the gills of *Atherina hepsetus*, L., to saponins. EUGEN MACOVSKI and EUFROSINE MACOVSKI (Arch. exp. Path. Pharm., 1938, 188, 405—417).—The concn.-action relation of poisoning of the fish by saponins is not linear, probably owing to the increase in permeability produced by increasing concns. of saponins. A mathematical treatment is given. H. O. S.

Absence of convulsive power of strychnine methiodide. H. BUSQUET and C. VISCHNIAO (Compt. rend. Soc. Biol., 1938, 127, 664—666).—The curare-like action is diminished and the convulsive power absent in strychnine methiodide. H. G. R.

Acute response of guinea-pigs to vapours of some new commercial organic compounds. IX. Pentanone (methyl propyl ketone). (U.S. Publ. Health Repts., 1936, 51, 392—399).—In the range of inflammable mixtures of pentanone and air the former markedly irritates the eye and nose. Pathological data are given. CH. ABS. (p)

Guanidine structure and hypoglycæmia. Branched-chain analogue of synthalin.—See A., 1938, II, 223.

Lu-jung, a Chinese drug. VII, VIII. T. MINESHITA (Folia Pharmacol. Japon., 1938, 25, 24—25).—VII. Lu-jung, if added to the food, stimulates the growth of tadpoles.

VIII. Lu-jung in concns. of 1 g. per kg. body-wt. by mouth or 5 c.c. of extract per kg. injected intraperitoneally increases the reticulocyte and erythrocyte count and the hæmoglobin concn. in rabbits. A. S.

Chemistry of some physiologically active substances related to phenanthrene. R. C. ELDERFIELD (Cold Spring Harbor Symp. quant. Biol., 1937, 5, 1—15).—A review. R. L. N.

Chinese materia medica. A review of some of the work of the last decade. B. E. READ (Chinese Med. J., 1938, 53, 353—362). P. C. W.

Posology of Chinese drugs. F. P. YUEH (Chinese Med. J., 1938, 53, 363—378). P. C. W.

Determination of the toxicity of medical substances. V. J. RÉGNIER, S. LAMBIN, and E. SZOLLOSI (J. Physiol. Path. gén., 1937, 35, 950—968).—Mathematical considerations for calculations of mean error, standard deviation, etc. are given and applied to data previously given in connexion with assays of insulin and various salts of novocaine and morphine. C. A. A.

Blood-poisons. W. HEUBNER (Arch. Gewerbepath. Gewerbehyg., 1937, 7, 655—656).—A brief note on the mechanism of poisoning by AsH_3 , tetralin, and aniline. M. A. B.

Latent benzene poisoning in the pregnant female. S. TARA (Sang, 1938, 12, 352—359).—Of 14 pregnant women with masked benzene poisoning only 4 had normal deliveries; 3 had serious uterine inertia, 1 stillborn, and 7 abortions. C. J. C. B.

Acute splenic hyperplasia in experimental chronic phenylhydrazine poisoning. E. LETTERER (Arch. Gewerbepath. Gewerbehyg., 1937, 7, 701—706).—Daily subcutaneous injections of phenylhydrazine increasing from 1 to 10 mg. over a period of 50 days reduced the hæmoglobin content of rats' blood by about 75%, while the spleen increased in wt. 10-fold. The fall in hæmoglobin was slow at first due to a high degree of tolerance. No icterus was observed. Breakdown and phagocytosis of injured red corpuscles was observed in liver and spleen. Granules of Fe-containing pigment were deposited in the tissues of spleen and kidney. M. A. B.

Action of dinitrophenol on liver- and muscle-glycogen in rabbits. M. CAHANE (J. Physiol. Path. gén., 1937, 35, 941—943).—25 mg. of dinitrophenol daily by mouth to rabbits reduced liver- and muscle-glycogen. This reduction and the fall in body-wt. were less marked in thyroidectomised animals. These facts together with histological results suggest that dinitrophenol stimulates the thyroid gland. C. A. A.

Food poisoning. III. Metal poisoning. E. B. DEWBERRY (Food Manuf., 1938, 13, 161—164; cf. A., 1938, III, 335).—The Cu contents of foods are set out. The average daily intake of Cu is adults 2.1, children 0.5—1.0 mg. The occurrence of Pb, Al, Sn, and Zn in foods is discussed. W. L. D.

Toxicity of the spores of *Amanita phalloides*. R. D. DE LA RIVIERE and P. GARNAL (Compt. rend., 1938, 206, 628—631).—The min. lethal dose for a mouse is 0.03—0.05 g. of spores macerated with water (intraperitoneally) and for a rabbit 0.05 g. per kg. (intraperitoneally or intravenously). 5 mg., the min. lethal dose, injected into the cerebrospinal fluid of the latter gives const. results. The toxicity is little affected by heating below 100° or by keeping for a long period. J. L. D.

Mouldy corn poisoning in horses. L. H. SCHWARTZ (J. Amer. vet. med. Ass., 1938, 45, 152—158).—Many cases of this condition are diagnosed as sp. encephalomyelitis. At autopsy, no sp. changes are found in the nervous system and all attempts to demonstrate the presence of a virus have failed. There is extensive degeneration of the white matter of the cerebral hemispheres. In two horses fed mouldy corn, there developed symptoms similar to those observed in naturally occurring cases and similar lesions were found at autopsy. Three control animals remained healthy. The seasonal incidence of the disease is different from that of sp. encephalomyelitis. Prevention and treatment are discussed. E. G. W.

Oat hay poisoning. F. THORP, jun. (J. Amer. vet. med. Ass., 1938, 45, 159—170).—Several outbreaks of oat hay poisoning in cattle are described. The symptoms suggest HCN as the poisonous agent but in only two cases was a trace of this substance found

in the hay. 6 cattle fed with the hay responsible for one outbreak all showed the symptoms and post-mortem lesions typical of the naturally occurring disease. The rumen contents of 4 animals were positive to the Na picrate paper test for HCN. Sheep and horses were not affected by the sample of hay used in the experiment. Aq., alcoholic, acid, and alkaline extracts of the hay were without effect on rabbits and guinea-pigs. E. G. W.

Experimental toxicity of the spores of wheat smut (*Ustilago tritici*) to mice. R. DEBRÉ and A. NÉVOT (Compt. rend. Soc. Biol., 1938, 127, 977—979).—The spores or extracts are toxic orally or parenterally to young but not to adult mice. H. G. R.

Experimental toxicity of the spores of wheat rust (*Tilletia tritici*). R. DEBRÉ and A. NÉVOT (Compt. rend. Soc. Biol., 1938, 127, 979—980).—The spores and extracts are toxic orally or parenterally to young mice. H. G. R.

Cataphoretic separation of toxic components of moccasin venom. W. MARX and S. M. PECK (Proc. Soc. Exp. Biol. Med., 1938, 38, 84—86).—When an e.m.f. of 120 v. is applied to solutions of venom for 3—5 hr. at p_H 6—7 the hæmorrhagic component and the hæmolysin A migrate to the anode, and hæmolysin B to the cathode. In the case of A the areas of hæmolysis on blood-agar plates are dark green or black; in the case of B they are colourless and transparent. V. J. W.

Adsorption of the neurotoxin and hæmolysin of cobra (*Naja naja*) venom by various adsorbents at different p_H , with a view to their isolation. S. S. DE and B. N. GHOSH (J. Indian Chem. Soc., 1937, 14, 748—755).—The relative adsorbing power of substances is $SiO_2 > kaolin > alumina$ "C" > alumina "A" > fuller's earth < kieselguhr. Adsorption by SiO_2 increases with increasing p_H . The stability of the neurotoxin is max. at p_H 5.8—7.0. By combining adsorption and elution with fractional pptn. of non-toxic proteins by Na_2SO_4 , the neurotoxin has been conc. F. R. S.

Scorpion poisoning in Trinidad. J. A. WATERMAN (Trans. R. Soc. trop. Med. Hyg., 1938, 31, 607—624).—In death from scorpion sting, the stomach, brain, kidneys, lung, liver, and heart show congestion and small hæmorrhages. The pancreas is normal, congested or hæmorrhagic. Death followed the sting in 1½—42 hr. The characteristic symptoms were slowing of the heart, rapid respiration, hyperglycæmia and glycosuria, salivation, vomiting, and shock. Pancreatic cysts and irregularity of the heart were frequent sequelæ. The heart symptoms are due to direct action of the toxin on the vagus centre and to injury to the conducting fibres of the heart; the salivation and vomiting to excretion of toxin; the hyperglycæmia to pancreatic damage; the increased respiratory rate to acidosis and the shock partly to relative hypoglycæmia (as the sugar present in the blood is not "normal" sugar and cannot be utilised) and partly to direct action of the toxin on the nervous system. Repeated stings produce little immunity. Treatment consists of application of a local tourniquet,

injections of 2 c.c. of 0.25% colloidal Mn and glucose salines, and treatment of shock. [B.] C. J. C. B.

Morphological changes in the livers of rats resulting from exposure to certain chlorinated hydrocarbons. G. A. BENNETT, C. K. DRINKER, and M. F. WARREN (J. Ind. Hyg., 1938, 20, 97—123).—A number of commercial mixtures of chlorinated naphthalenes and chlorinated diphenyl were administered to rats. Their toxicity seemed to be related to the degree of chlorination; mixtures containing chlorinated diphenyl were the most toxic. The liver, the only organ affected, showed changes ranging from cloudy swelling to complete disintegration; the lesions did not resemble acute yellow atrophy, and were similar whether the compounds were inhaled, fed, or injected; their severity varied with the dosage. Administration of a sub-lethal dose of CHCl_3 and ethyl alcohol to rats whose livers were already injured by these chlorinated compounds was fatal, with massive necrosis of the liver. These results are discussed in relation to the industrial hazard.

E. M. K.

Thermal element in the cutaneous reactions to histamine and its value in diabetics. GUY-LAROCHE, J. SAIDMAN, and B. HADJIPAVLOS (Compt. rend. Soc. Biol., 1938, 127, 999—1001).—Lewis' reaction (erythema on cutaneous injection of histamine) is accompanied by a local increase in temp., diabetics being hyposensitive to the reaction.

H. G. R.

Use of calcium chloride in relief of chills following serum administration. P. B. BEESON and C. L. HOAGLAND (Proc. Soc. Exp. Biol. Med., 1938, 38, 160—162).—Rigors caused by antipneumococcic serum were relieved in several cases by the intravenous injection of 10—20 c.c. of 10% CaCl_2 provided that no adrenaline had been given in addition.

V. J. W.

Preparation and administration of globulin from rabbit antipneumococcic serum. M. HEIDELBERGER, J. C. TURNER, and C. M. S. HOO (Proc. Soc. Exp. Biol. Med., 1938, 37, 734—736).—The globulin is pptd. by saturated Na_2SO_4 and removed by centrifuging. For administration it is dissolved in 500 c.c. of saline and can be given intravenously without toxic reactions.

V. J. W.

Anaphylactic shock prevented by ketenising serum. M. J. BOYD and J. T. TAMURA (Proc. Soc. Exp. Biol. Med., 1938, 38, 184—187).—Anti-*Brucella* serum through which keten had been passed for 35 min. failed to cause shock in sensitised guinea-pigs which were killed by smaller doses of untreated serum. The agglutinating power of the serum was very slightly diminished.

V. J. W.

Allergic conjunctivitis due to fungi. F. A. SIMON (J. Amer. Med. Assoc., 1938, 110, 440).—A case of conjunctivitis is described, due to an allergic reaction to the spores of air-borne fungi. R. L. N.

Relation of ultra-violet irradiation of operation field to anaphylaxis and non-specific therapy. H. HAVLICEK and A. JONASCH (Klin. Woch., 1937, 16, 1183—1187).—10—15 min. irradiation of the peri-

toneum of anaphylactic rabbits produced desensitisation with persistence of the neutralising properties of antibodies to the original antigen. Excessive irradiation led to a diminished precipitating titre.

F. W. L.

Significance of lymphatics in allergy. E. FISCHER and H. KAISERLING (Klin. Woch., 1937, 16, 1143—1146).—Sp. inflammatory reactions occur in lymphatic capillaries especially in the gall-bladder region, with secondary involvement of the cisterna chyli and coeliac ganglion in rabbits sensitised to swine serum.

F. W. L.

Allergically active substance in ragweed pollen extract; a single or multiple entity. A. W. H. COULFIELD, M. H. BROWN, and E. T. WATERS (J. Allergy, 1935, 7, 1—24).—More than one allergically active substance occurs in the extracts, and serum from ragweed hay fever patients contains more than one sp. reagin.

CH. ABS. (p)

Anaphylactisation and the development of anaphylaxis by a chemically known substance. Oleyl-N-methyltaurine. H. E. FIERZ, W. JADASOHN, and A. MARGOT (Helv. Chim. Acta, 1938, 21, 293—301).—Anaphylactisation of guinea-pigs can be caused by intraperitoneal injection of oleyl-N-methyltaurine. In animals thus treated, anaphylactic reactions are regularly developed by oleyl-N-methyltaurine.

H. W.

Relationship of the nervous system to allergic reactions. H. KAISERLING (Virchow's Arch., 1938, 301, 111—139).—Allergic reactions appear earlier and develop more quickly in a denervated than in an innervated kidney owing to hyperamia in the former. Electric stimulation and section of the sciatic nerve of the rabbit do not alter the allergic reaction of the muscular tissue, with the exception of an intensified reaction during the first few days following the denervation.

H. W. K.

Cellular reactions in cantharidin blisters in the allergic animal. L. BALLING (Virchow's Arch., 1938, 301, 72—90).—The cell content of cantharidin blisters of the skin of rabbits' ears was examined. In animals treated with repeated injections of horse serum, typical changes in the no. and composition were observed, viz., the no. fell when immunity was high, as measured by the precipitin titre, and basophil "lympho-histiocytes" were present in large nos. when immunity was low during the period of anaphylaxis. These basophil cells were absent in cantharidin blisters of animals not treated with serum.

H. W. K.

Reversed iontophoresis of histamine from human skin. Its bearing on histamine theory of allergic wheal. H. A. ABRAMSON, M. ENGEL, V. LUBTEIN, and I. OCHS (Proc. Soc. Exp. Biol. Med., 1938, 38, 65—66).—Sufficient histamine can be recovered electrically from a histamine wheal to produce a secondary wheal when the electrode is applied elsewhere. No such histamine recovery is possible in the case of wheals caused by ragweed, timothy grass, ultra-violet irradiation, or in dermatographia.

V. J. W.

Production of wheals in human skin. H. A. ABRAMSON (Science, 1938, 87, 299).—In hyper-

sensitive individuals the introduction of pollen extracts of ragweed and timothy grass by iontophoresis produced typical wheals in the skin. This occurred with both negative and positive poles. Further, histamine (positively charged) can be removed from wheals produced by histamine by application of the negative electrode. Histamine has not yet been thus removed from the allergic wheal. C. A. K.

Biological polyvalency of antigens with special reference to hay fever. J. FREEMAN and W. H. HUGHES (*Lancet*, 1938, 234, 941—942).—Foreign grasses may give positive skin reactions in hay-fever subjects who have not previously been exposed to them. C. A. K.

Allergic reactions produced by parenteral administration of the animal's own serum. W. EICKHOFF (*Virchow's Arch.*, 1938, 301, 264—272).—Serum of a guinea-pig or rabbit was conc. under sterile conditions by the method of Flosdorf and Mudd and kept on ice. Before use it was diluted with sterile distilled water. The serum was injected twice into the same animal from which it was obtained, (i) 3 weeks after the withdrawal of blood and (ii) 3 weeks later. This procedure resulted in typical allergic reactions at the site of the injection, sometimes accompanied by slight anaphylactic shock. The phenomenon is attributed to the alterations in the blood after its withdrawal from the circulation. The absence of allergic reactions after repeated autogenous blood transfusions is assumed to be due to the presence of antibodies in the injected blood. H. W. K.

Discussion on certain aspects of the asthma problem. (*Proc. Roy. Soc. Med.*, 1938, 31, 529—536).—F. M. RACKEMANN: It is not certain that an allergic background is universal. Clinical allergy, although possibly only an exaggeration of a normal response, is characterised by extreme and varied sensitiveness which is frequently inherited. Some factor other than sensitisation may be necessary for the development of clinical allergy. Antigens can enter the blood through the respiratory and gastro-intestinal tracts, and after subcutaneous injection. Lesion in acute uncomplicated asthma is hypertrophy of mucous glands in bronchial walls and secretion of mucoid material charged with epithelial debris which clots and plugs the bronchus. Discussion by L. J. WITTS, E. R. BOLAND, L. S. T. BURRELL, and F. COKE. W. J. G.

Evidence of group-specific and species-specific sensitisation to pollens. G. D. GRUBB and W. T. VAUGHAN (*J. Allergy*, 1938, 9, 211—226).—Study of closely related pollens showed evidence of the existence of group- and species-sp. allergens, but no single pollen was representative of any entire group. Red-top cross-reacted most frequently with other grasses but not enough to justify its use as a single pollen for recognition of grass allergy. Short ragweed held a similar place among the composites. When several pollens within a group react positively, it may be necessary to treat with more than one of the positive reactors. 42% of 300 cases had positive skin reactions to pollens to which they presumably had not sufficient exposure to develop sensitisation. About

half of the patients allergic to the pollen of food plants were also allergic to the corresponding foods.

C. J. C. B.

Significance of developmental growth studies in the evaluation of clinical allergy. T. W. TODD (*J. Allergy*, 1938, 9, 234—240).—A general review.

C. J. C. B.

Prevention of dermatitis venenata due to poison ivy in children. Comparison of the value of single and multiple injection methods. M. MOLITAH and S. POLIAKOFF (*J. Allergy*, 1938, 9, 270—272).—28 boys were given 2 injections and 22 one injection of commercial poison ivy extracts. Only 7 (14%) developed dermatitis during the season. Of 15 controls, 6 (40%) developed dermatitis as well as 24 others who entered the institution but were not immunised.

C. J. C. B.

House fly as a cause of nasal allergy. H. C. JAMESON (*J. Allergy*, 1938, 9, 273—274).—By history, positive scratch, intracutaneous and passive transfer tests, it was, shown that the house fly caused nasal allergy in one patient.

C. J. C. B.

Tobacco sensitisation in rats. J. KARKAVY (*J. Allergy*, 1938, 9, 275—281).—11 male rats were injected intraperitoneally daily, for 6—12 weeks, with a special tobacco extract. 5 developed gangrene of the toes and were shown to be sensitive to tobacco by intestinal strip prep. 4 of the 5 had also been injected with horse serum, egg white, or ragweed, but did not show sensitivity to these antigens. Of the remaining 6, only 3 showed tobacco sensitivity. 3 female rats after injection failed to show gangrene or sensitivity. 7 control rats showed no sensitivity to tobacco, whilst 1 injected with ragweed also failed to become sensitive to the latter antigen. C. J. C. B.

Recent developments in asthma and hay fever. Literature for 1937. S. M. FEINBERG (*J. Allergy*, 1938, 9, 282—309).

C. J. C. B.

(r) INDUSTRIAL PHYSIOLOGY AND HYGIENE.

Influence of position of saddle on maximum work and efficiency in cycling. E. A. MÜLLER (*Arbeitsphysiol.*, 1938, 10, 1—7).—In unbroken work with a const. no. of pedal revolutions maximal work and efficiency were less when the saddle was considerably tilted forward or backward. Increase in the height of the saddle increased the max. work done but efficiency was greater with a level of the saddle such that the pedals at their lowest point could just be reached.

E. J. W.

Relationship of maximum work to rate of work in different persons. E. A. MÜLLER (*Arbeitsphysiol.*, 1938, 10, 67—73).—In unbroken work on the stationary cycle at a const. no. of pedal revolutions per min., the max. work (A_{max}) was measured at different rates of work (N). It follows the equation $\log A_{max} = a_1 \log N + b_1$ where a_1 and b_1 are const. The val. of a_1 varies greatly in different individuals; it is highest in those capable of maintaining exercise for long periods.

E. J. W.

Industrial hygiene applied to the clothing manufacturing industry. W. H. SCHULZE (*Amer. J. Publ. Health*, 1938, 28, 476—478).

W. L. D.

Clinical and neuropathological aspects of electrical injuries. L. ALEXANDER (J. Ind. Hyg., 1938, 20, 191—243).—Five cases of electric shock are described in detail, of whom 3 recovered, 2 with nervous sequelæ. Case 1 showed signs suggestive of cerebral oedema, cervical hæmatomyelia, and small scattered lesions in the anterior horns. In case 2 the signs were of lesions of the anterior horn cells of C5-7. The post-mortem findings in the two fatal cases were cerebral oedema, congestion of small cerebral vessels, hæmorrhages, stasis, thrombosis of venules, and small foci of perivascular demyelination. The changes point to a primary interference with the circulation, by extreme contraction of the heart and vasoconstriction, followed by inhibition of the heart. There was evidence of survival for several hr. after the shock; therefore the inhibition of the heart is probably vagal, not ventricular. E. M. K.

Toxic encephalopathy and "granulopenic anæmia" due to volatile solvents in industry: report of two cases. C. E. PARSONS and M. E. M. PARSONS (J. Ind. Hyg., 1938, 20, 124—133).—Two cases of illness are described in workers using Methyl Cellosolve (ethylene glycol monomethyl ether) and Solox (ethyl alcohol, methyl alcohol, ethyl acetate). The symptoms were lethargy, dizziness, nausea and vomiting, headache, dyspnoea, and changed personality. Examination showed general muscular hyper-tonicity, slight ataxia, moderate anæmia (high colour index), with leucopenia and relative lymphocytosis. Removal from exposure to the volatile solvents, with appropriate treatment of the anæmia, was followed by recovery from the toxic effects on the central nervous system and on the blood-forming organs. E. M. K.

Health hazards in the manufacture of "fused collars." I. Exposure to ethylene glycol monomethyl ether. L. GREENBURG, M. R. MAYERS, L. J. GOLDWATER, W. J. BURKE, and S. MOSKOWITZ. II. Exposure to acetone-methanol. L. GREENBURG, M. R. MAYERS, L. J. GOLDWATER, and W. J. BURKE (J. Ind. Hyg., 1938, 20, 134—147, 148—154).—I. The solvent used was 33% of ethylene glycol methyl ether, with 67% of denatured alcohol (ethyl and methyl alcohol, ethyl acetate, and petroleum naphtha); the temp. favoured volatilisation from the open vessels used. Air analysis showed glycol ether 25—75 p.p.m., ethyl alcohol 70—250 p.p.m. 19 workers examined all showed abnormal blood pictures; 9 had low red cell counts with high colour index; all had a high proportion of immature polymorphs, with a normal total white cell count. There were abnormal neurological findings (mental retardation, hyper-reflexia, ankle clonus, and tremor) in 11 cases, 4 of whom experienced no symptoms. It is suggested that ethylene glycol monomethyl ether was responsible for these changes, and that its concn. in air should be kept below 25 p.p.m.

II. Examination of workers exposed to the fumes of acetone and methanol in a collar-fusing plant showed no abnormalities, although the finding of acetone in their urine indicated absorption of the solvent.

E. M. K.

(A) Biological effects of inhalation of carbon arc fumes. (B) Combustion products of the carbon arc. E. L. MACQUIDDY, J. P. TOLLMAN, L. W. LA TOWSKY, and M. BAYLISS (J. Ind. Hyg., 1938, 20, 297—311, 312—320).—(A) Three groups of animals were exposed to the fumes from a carbon arc. (1) Mice, kittens, rats, guinea-pigs, and a rabbit exposed continuously. All died in 1—21 hr. except two guinea-pigs. (2) Guinea-pigs and rats exposed for 1 hr. a day for a max. of 10 months. The guinea-pigs survived and showed no pathological effects but the rats died in 11—32 weeks. (3) Guinea-pigs and rats exposed for 4 hr. a day for a max. of 8 months. 90% of the guinea-pigs died in 2—7 months and all the rats in 1—16 weeks. All the dead animals showed lung damage.

(B) A concn. of NO₂ of 72—147 p.p.m. at 25° and 760 mm. occurred in the fumes drawn from the non-rotating positive high-intensity C. arc. CO₂ concns. ranged from 2770—2450 p.p.m. CO, SO₂, and O₃ were not detected. E. M. K.

Skin conditions resulting from exposure to certain chlorinated hydrocarbons. M. R. MAYERS and M. G. SILVERBERG (J. Ind. Hyg., 1938, 20, 244—258).—31 workers in the finishing departments of plants using tri- and tetra-chloronaphthalene to insulate condensers were examined. 6 showed severe and 4 milder acneform eruptions; 1 had a vesiculopustular eruption, and 2 a simple erythema with pruritus. The eruption usually appeared during the first few months of employment. The condition was unrelated to the incidence of acne vulgaris, and to sensitivity to the halogens, but there was evidence of family predisposition. Patch tests were negative. Preventive measures are discussed. E. M. K.

Silicosis and tuberculosis. Origin and character of silicotic lesions as shown in cases occurring on the Witwatersrand. F. W. SIMSON and A. S. STRACHAN (Publ. S. African Inst. Med. Res., 1935, 6, 367—406).—"Simple" and "infective" types of silicotic lesions are described. Inoculation of preps. of "simple" lesions into guinea-pigs resulted in negative tests for tuberculosis; with "infective" types, tuberculosis tests were positive in most cases. Birefringent mineral particles were numerous in all lesions but not in unaffected parts of the lung, and in silicotic lungs increased with the degree of silicotic change ultimately reached. CH. ABS. (p)

Metallic retention in dermatological conditions. B. THRONE and C. N. MEYERS (Arch. Pediat. 1936, 53, 8—26).—Chronic As and Pb poisoning arise largely from spray residues on foods and occupational contact. Deposition of metal in cutaneous cells lowers their resistance to irritants. CH. ABS. (p)

(s) RADIATIONS.

Specific cell changes of geometric configuration produced by electricity. S. JELLINEK (Virchow's Arch., 1938, 301, 28—48).—The shape of cell nuclei of tissues subjected to electric currents on low or high tension, d.c. or a.c., of low or high frequency showed typical changes. Particular attention was paid to the changes in cells of the walls of

blood vessels. The nuclei were often elongated and assumed spiral shapes. In some instances single cells were affected, but in others great nos. of neighbouring cells were rearranged in a manner resembling the lines of an electric field. Often a change in the cell vol. was observed, the structure being either compressed or spread out. Similar changes were observed in tissues severed by the diathermy knife.

H. W. K.

Primary process in damage by rays. H. LANGENDORFF and K. SOMMERMEYER (Naturwiss., 1938, 26, 234).—The action of light of different $\lambda\lambda$ on *Drosophila* eggs and other biological objects supports the view of Jordan (Radiologica, 1938, 16) as to the mechanism of the biological effect of such rays and the close relation to gene mutation.

W. O. K.

Hemihyperhidrosis after sun-stroke. G. KLOOS (Nervenarzt, 1938, 11, 132—135).—Persistent left-sided hyperhidrosis was seen in a man aged 34 years, following sunstroke 5 years previously. The sweating was most marked in warm weather.

C. A. K.

Revised technique of actinic sunshine analysis, with modifications for freezing weather and near meridian exposures. F. O. TONNEY and P. P. SOMERS (Amer. J. Hyg., 1938, 27, 370—379).—An easy and reliable method is described for making actinic surveys in any community, involving the exposure of an oxalic acid-uranyl sulphate solution to sunlight and titration of the decomposed oxalic acid against KMnO_4 . A schedule is given for antirachitic procedure throughout the year in the Chicago area.

G. P. G.

Proliferation-promoting factors from ultra-violet injured cells. G. S. SPERTI, J. R. LOOFBOUROW, and C. M. DWYER (Stud. Inst. Divi Thomae, 1937, 1, 163—191).—After destruction of the cells of *Saccharomyces cerevisiae* by ultra-violet light, a diffusible substance can be extracted which stimulates growth of uninjured *S. cerevisiae* cells. This proliferation-promoting factor can be obtained in small amounts from mechanically injured cells. The relation of this factor to wound healing and to cancer-cell division is indicated (cf. A., 1937, III, 473).

D. BU.

Sublethal effects of long wave length ultra-violet. A. C. GIESE (Science, 1938, 87, 326—327).—Large dosages of radiations of λ 3130 Å. produced slight retardation of cleavage of eggs of *Strongylocentrotus purpuratus* (sea urchin) and slight prolongation of excystment time of *Colpoda duodenaria* cysts. Fairly large dosages of radiations of λ 3660 Å. had very little effect.

C. A. K.

Modification of primordial morphogenesis of amphibians by the early action of ultra-violet rays. J. BRANDES (Bull. Acad. roy. Belg., 1938, [v], 24, 92—108).—Irradiation of the recently (artificially) fertilised eggs of *Rana fusca* or of the young gastrulae of *Pleurodeles Waltii* results in the production of various asymmetrical abnormalities. The curvature of the asymmetry in relation to the irradiation varies, being sometimes in one direction and sometimes in the other.

W. O. K.

Penetration of ultra-violet rays through chitin. G. ELOFF and V. L. BOSAZZA (Nature, 1938, 141, 608).—Irradiation through a Vitreosil plate 0.5 cm. thick using a Hanovia quartz Hg-vapour lamp produces marked effects on the wing development of aged pupae of *Drosophila melanogaster*. This effect has been used to determine the effective penetrability of chitin to ultra-violet rays. With a chitin layer approx. 21 μ . thick, formed from 3 flying wings of *Nomadacris septemfasciata*, $\lambda\lambda$ above 3650 Å. were biologically ineffective. A spectrographic analysis of $\lambda\lambda$ which penetrated these chitin screens is also given, and is in agreement with the biological results.

L. S. T.

Effect of soft X-rays on chaetopods. H. KERSTEN and H. BRANSON (Nature, 1938, 141, 554—555).—Morphological changes are described.

L. S. T.

Effect of X-radiation on the blood and lymphoid tissue of tumour-bearing animals. J. R. CLARKSON, W. V. MAYNEORD, and L. D. PARSONS (J. Path. Bact., 1938, 46, 221—235).—The rate of growth of mouse sarcoma and size of tumour were greater in irradiated than non-irradiated animals and grafts into successive generations took more often in the former. General irradiation causes atrophy of spleen and lymph glands, marked anaemia, and fatty changes in liver and kidneys. The lymph glands are in part converted into haemolymph glands concerned with the phagocytosis of red cells. Blood destruction in the lymphoid tissue of X-rayed animals or in non-irradiated mice developing sarcoma is possibly the cause of deposition of Fe in the tissues of these animals.

W. L. D.

Determination of the magnitude of the cell "sensitive volume" associated with the white-eye mutation in X-rayed *Drosophila*. III. C. P. HASKINS and E. V. ENZMANN (Proc. Nat. Acad. Sci., 1938, 24, 136—141).—Observations on males show a linear relation between % affected and duration of X-ray dosage, and from the series the "sensitive vol." is calc. It is confirmed that these "sensitive vol." determinations cannot be made in females, except in the case of "specially balanced stocks."

W. F. F.

Reducing action of Röntgen rays on reduction-oxidation potential of indicator dyes.—See A., 1938, I, 315.

(t) PHYSICAL AND COLLOIDAL CHEMISTRY.

Classification of biological colloids. II. Analysis and determination of type of linking. S. J. VON PRZYŁĘCKI (Kolloid-Z., 1938, 83, 51—71; cf. A., 1937, III, 253).—General methods for the recognition of various types of linking (salt, covalent, mol. aggregation by polar groups, aggregation of hydrocarbon chains, etc.) between biological colloids, and for the separation of the components, are described and examples given.

F. L. U.

Surface denaturation of ovalbumin. H. WU and C. F. WANG (J. Biol. Chem., 1938, 123, 439—442).—The rate of surface denaturation by shaking is independent of the concn. of ovalbumin. The process

differs from heat-denaturation in consisting of one process only (cf. Bull and Neurath, A., 1937, III, 168).

P. G. M.

Complexes of substances of high mol. wt. in the living organism. S. J. PRZYŁĘCKI (Acta Biol. Exp., 1937, 11, 308—331).—A lecture. R. T.

Properties of hæmoglobin and pepsin in solutions of urea and other amides. J. STEINHARDT (J. Biol. Chem., 1938, 123, 543—575).—When native isoelectric hæmoglobin (horse) is dissolved in solutions containing high concns. of urea or other amides, dissociation occurs into mols. of half the normal mol. wt., as judged by measurements of sedimentation and diffusion consts. and partial sp. vols. Similar concns. of amides do not change the mol. wt. of pepsin. Reassociation into normal and larger aggregates occurs on removal of amides by dialysis. Spectroscopic tests and gas capacity and affinity measurements show that the change of hæmoglobin to half mols., certain derivatives of which are unstable, is unaccompanied by denaturation. Oxidation of the half mol. to methæmoglobin is followed by a change into an apparent parahæmatin possessing the property of being transformed into ordinary reduced hæmoglobin on reduction with $\text{Na}_2\text{S}_2\text{O}_4$. Theories of the interrelationship of various hæmoglobin derivatives are discussed in connexion with this property. The great effects of amides on protein solubility are apparent at concns. much lower than those at which dissociation occurs, being as great with the non-dissociating pepsin as with hæmoglobin. A stereo-polarisation mechanism based on the repeated occurrence of the amide bond in polypeptide chains is advanced to account for the specificity of amides in producing these effects. T. F. D.

Crystallisation and desiccation of certain proteins under the action of cold. M. PIETTRE (Food Res., 1938, 3, 161—165).—The prep. and properties of the three cryst. serum-proteins (albumin, globulin, and myxoprotein) and the behaviour of cryst. oxyhæmoglobin when dried at -5° are described. E. C. S.

Stream double refraction of virus-proteins. M. A. LAUFFER and W. M. STANLEY (J. Biol. Chem., 1938, 123, 507—525).—A micro-method for the quant. comparison of the double refraction of flow of purified virus-proteins is described. Proteins from tobacco mosaic virus show the phenomenon. *Limulus* and *Helix* hæmocyanin and thyroglobulin (pig) show slight, and elementary bodies of vaccinia and the Shope papilloma virus-protein no, stream double refraction. The phenomenon is due to the orientation of rods and not to a photo-elastic effect. Conc. solutions of tobacco mosaic virus-protein on keeping were found to separate into two layers, the bottom showing spontaneous double refraction. T. F. D.

p_H -Stability of papilloma virus protein. J. W. BEARD and R. W. G. WYCKOFF (J. Biol. Chem., 1938, 123, 461—470; cf. A., 1937, III, 435).—The p_H range of stability of the mol. and infectiousness of solutions of purified heavy protein isolated by quant. ultra-centrifuging from virus-induced warts on rabbits have been determined. Inactivation of the virus

occurs at about p_H 2.8—2.9 and at 10.1, at which vals. the protein mol. is degraded. In slight alkaline solution, there is a gradual loss of activity which is not connected with changes in mol. wt. J. N. A.

Intermediate forms of oxidation-reduction of flavins. L. MICHAELIS and G. SCHWARZENBACH (J. Biol. Chem., 1938, 123, 527—542).—Reductive titration curves for alloxazine dyes, glucoisalloxazine, and riboflavin have been investigated with variation in p_H and concn. At low concns. including the physiological range, there is an intermediate form of reduction represented by a free radical. In higher concns. of the dye, partial dimerisation to a bimol. compound occurs; the equilibrium const. has been calc. No other mol. species on an oxidation level between flavin and dihydroflavin can be detected in solution. The conditions in the cryst. state or in combination with the sp. proteins are different from those in a simple homogeneous aq. solution of the dye, and are discussed. T. F. D.

Influence of hydrogen-ion concentration on the surface tension of some colloidal solutions. P. W. PERRYMAN and C. F. SELOUS (J. Physiol., 1938, 92, 151—159).—The lyophilic systems (ovalbumin, serum-albumin, serum-globulin, gelatin, casein, ovarian cyst fluid, brilliant-green) were examined and the variation of surface tension with $[\text{H}^+]$ found. Each system, with the exception of casein, shows a min. val. of surface tension at the isoelectric point; all the systems show a max. rate of surface adsorption at this p_H . Use is made of the surface tension- p_H relationship to identify the major proteins in the fluid from an ovarian cyst. J. A. C.

Cryoscopic lowering of the interior medium of the anodont during prolonged starvation. M. FLORKIN (Bull. Acad. roy. Belg., 1938, [v], 24, 24—28).—The osmotic pressure, measured by the lowering of the f.p., of the blood of the anodont kept without food undergoes little change for 22 months, after which it falls rapidly to about half of its original val. W. O. K.

Electrodialysis of blood-serum. M. MAZILLE (Compt. rend., 1938, 206, 379—380).—Using a Pb anode which forms insol. compounds with Cl and CO_3 and a Hg cathode which forms amalgams with K and Na, blood serum has been directly deprived of electrolytes, free and protein-bound, by electro-dialysis. The separated proteins are not denatured if the current is less than 2 ma. and preserve their immunological properties, as has been proved with antisheep hæmolytic serum. T. F. D.

X-Ray study of Palmer's lactoglobulin. D. CROWFOOT and D. RILEY (Nature, 1938, 141, 521—522).—X-Ray measurements show that the two types of lactoglobulin crystals differ in crystal structure and probably in water content. The tabular crystals, orthorhombic, pseudo-tetragonal, birefringence negative (approx. 0.004), are heavily hydrated. When removed from the mother-liquor they shrink in the direction of the c axis, and the birefringence falls to less than 0.001. For crystals mounted in their mother-liquor $a = b = 63.5 \text{ \AA.}$, $c = 145 \text{ \AA.}$; space-group $P2_12_12_1$, and for the dry crys-

tals $a = b = 59$ Å., c 105 Å. The unit cell probably contains 8 mols. in both cases. The wet needle crystals appear to be tetragonal, elongated along c , with $a = b = 63.5$ Å., c 125 Å.; space-group $P4_22_1$. Their positive birefringence suggests that they differ from the tabular form in the orientation of the mols. as well as in water content. The dried crystals indicate a new unit cell with approx. $a = b = 54$ Å., c 125 Å. For the wet tabular crystals d is not more than 1.257, and for the dry crystals, about 1.27. The calc. mol. wt. of the protein is 35,300 or 36,500. The crystal structure of these protein crystals is compared with those of pepsin, insulin, haemoglobin, and chymotrypsin. L. S. T.

Mol. wt. of a tobacco-seed globulin. D. CROWFOOT and I. FANKUCHEN (Nature, 1938, 141, 522—523).—Three X-ray powder lines of a prep. of a tobacco-seed globulin correspond with the first three reflexions from a cubic face-centred lattice with a 123 Å. Assuming the presence of only the 4 mols. in the unit cell required by the symmetry, and using the val. of 1.287 ± 0.001 determined for d , the calc. max. mol. wt. of the asymmetric unit is 363,000. The loss in wt. in a vac. at 100° , due probably to water of crystallisation, is 10.4%. This gives 325,000 as the max. mol. wt. of the dried protein. The possibility that the true chemical mol. wt. of the globulin is a sub-multiple of this val. is not excluded. L. S. T.

X-Ray study of chymotrypsin and haemoglobin. J. D. BERNAL, I. FANKUCHEN, and M. PERUTZ (Nature, 1938, 141, 523—524).—Chymotrypsin crystallises in thick diamond-shaped plates, monoclinic twins, with a 49.6, b 67.8, c 66.5 Å., β 102° for the crystals in the mother-liquor, and a 45, b 62.5, c 57.5 Å., β 112° for the dried crystals. The space-group is probably $P2_1$ in both cases, and the cell vols. are 219,000 and 151,000 Å.³, respectively. The considerable shrinkage that occurs on drying is mainly in the direction of the c -axis. For the wet crystals d is 1.277, giving a mol. wt. of 42,300, including water of crystallisation, and assuming 4 mols. per cell. The haemoglobin crystals are monoclinic and usually twinned, with a 109, b 63.2, c 54.2 Å., β 112° for the wet crystals, and a 102, b 56, c 49 Å., β 134° for the dry. In both cases the space-group is $C2$ with a face-centred pseudo-hexagonal cell. The cell vols. are 348,000 and 202,000, respectively, and shrinkage occurs more by the increase of β than by shortening of cell edges. For the wet crystals d is 1.242, which gives a mol. wt. of 131,000 for protein and water on the assumption of 2 mols. per cell. The mol. arrangement is discussed. L. S. T.

Electric mobility and titration curves of proteins.—See A., 1938, I, 311.

(u) ENZYMES.

Indophenol-oxidase in neoplastic tissue. G. MELOT (Bull. Soc. Chim. biol., 1938, 20, 352—364).—Heart, liver, and kidney tissue, benign and malignant tumours, and certain neoplastic tissues (but not fibrous tissue) react with the Nadi reagent (solution of dimethyl- p -phenylenediamine and α -naphthol) due to the presence of indophenol-oxidase. Previous

heating of the tissue at 52° for 90 min. or treatment with ethylurethane decreases the intensity of the reaction, whilst a few min. at 100° or the action of dil. KCN renders it negative. The reactions are comparable in benign and malignant tumours, but the intensity of the reaction cannot be used to determine the degree of malignancy as it appears to be dependent on the origin of the tumour. J. N. A.

Co-enzyme of the d -amino-acid oxidase. F. B. STRAUB (Nature, 1938, 141, 603—604; cf. A., 1938, III, 341).—Methods used in the prep. of the sol. amino-acid oxidising enzyme of Krebs from pig's kidney, and of its co-enzyme from horse heart muscle, are detailed. The activity of the co-enzyme is proportional to the content of flavin which may form a part of the active compound. L. S. T.

Activator of alanine-dehydrogenase. N. B. DAS (Naturwiss., 1938, 26, 168).—Kidney tissue and top yeast contain a thermolabile (destroyed by heating to 80 — 85° at p_H 8.0) activator for the enzymic oxidation of dl -alanine (cf. A., 1936, 894, 1296).

F. O. H.

Heat production in enzymic processes. I. Succinic dehydrogenase. II. Tyrosinase. III. Dehydrogenases of hexosediphosphoric, lactic, and pyruvic acids. M. MITSUYASU (J. Biochem. Japan, 1938, 27, 91—96, 96—100, 100—105).—I. The heat evolved on enzymic (ox muscle prep.) dehydrogenation of succinate is 24.5 kg.-cal. per g.-mol.

II. The oxidation of tyrosine by tyrosinase (potato, mealworm) is exothermic. The amount of heat evolved at the stage of melanin formation is greater than that at the formation of the red substance. With p -cresol and pyrocatechol as substrates, the heat productions are approx. equal. The addition of glycine to the tyrosinase- p -cresol system increases the amount of heat evolved.

III. The oxidation of 1 g.-mol. of Na hexose diphosphate by an enzyme prep. from pig's heart-muscle is accompanied by evolution of 21.3 kg.-cal.; traces of KCN completely inhibit the heat production. Enzymic oxidation of Na lactate or pyruvate is not accompanied by measurable production of heat.

F. O. H.

Chemical attack on glycogen in the rabbit muscle and rat sarcoma. H. VON EULER and E. BAUER (Naturwiss., 1938, 26, 235—236).—Glycogen does not reduce methylene-blue in presence of dialysed rabbit muscle extracts in presence of codehydrogenases I and II, flavin enzyme, Mg^{++} , Mn^{++} , and PO_4^{---} , but does so on the further addition of a ppt. obtained from yeast juice by CO_2 . Analogous results are obtained with sarcoma extracts.

W. O. K.

Enzymes of placenta. Effect of "follicular hormone" on enzymic action. Y. IWASAKI (Fukuoka Acta med., 1938, 31, 14—16).—Using Thunberg's methylene-blue method dehydrogenases were found in fresh human placental pulp for maleic, succinic, and lactic acid, glyceraldehyde, and dihydroxyacetone. Dehydrogenase activity is strongest at 3—4 months, and declines as term is approached. Using Fiske and Subbarow's method, glycerophosphatase and hexose diphosphatase were found in

placental tissue. No lipase was found in placenta. Follicular hormone increases the fat synthesising action of pancreatic lipase, and inhibits the fat-splitting action of the lipase. W. D' A. M.

Mechanism of enzyme action in presence of heavy water. A. DE PEREIRA-FORJAZ and K. P. JACOBSON (Compt. rend. XVII Cong. Chim. Ind., 1937, 487—493; cf. A., 1933, 862; 1936, 1025; 1937, III, 220).—The rate of decolorisation of methylene-blue in 99.6% D₂O by malic acid dehydrogenase in presence of K l-malate is greater than that in water. The equilibria attained in the reactions fumaric acid \rightleftharpoons l-malic acid and aspartic acid \rightleftharpoons fumaric acid brought about by fumarase and aspartase, respectively, are the same in 99.6% D₂O as in water. W. McC.

Cytochrome-oxidase. D. KELLIN and E. F. HARTREE (Proc. Roy. Soc., 1938, B, 125, 171—186).—By addition of 10⁻⁵—10⁻⁴M cytochrome-c to heart-muscle oxidase prep., the rate of catalytic oxidation of a no. of diamines and polyphenols (*p*-phenylenediamine, *p*-aminophenol, quinol, adrenaline, pyrocatechol, etc.) which readily reduce a solution of oxidised cytochrome-c, is greatly increased. Oxidation of all these compounds is not catalysed directly by indophenol-oxidase but through cooperation with cytochrome. Since the only catalytic property definitely ascribable to the muscle-oxidase (indophenol-oxidase) is oxidation of reduced cytochrome, its correct name should be cytochrome-oxidase. Explanations suggested by other workers as to the nature, distribution, and catalytic activity of this enzyme are discussed. F. B. P.

Mechanism of cytochrome action. T. B. COOLIDGE (J. Biol. Chem., 1938, 123, 451—459).—The prep. of cytochrome-c from yeast, using adsorption on permutit and elution with 5% aq. NH₃ as a final process of purification, is described. The indophenol-oxidase of heart muscle adsorbs cytochrome and cozymase forming a catalytically active product. A P-containing fraction associated with crude cytochrome preps. (and removed in the permutit treatment) exerts an inhibitory action on the dehydrogenase-co-enzyme-substrate reaction. P. G. M.

Mol. wt. of crystalline catalase. J. B. SUMNER and N. GRALÉN (Science, 1938, 87, 284).—Cryst. catalase from beef liver has a sedimentation const. of 12.0 \times 10⁻¹³ at *p*_H 6.3—9.6. No enzymic activity was found in the upper portion of the solution obtained after centrifuging; activity followed the high-mol., coloured substance. The diffusion const. is 4.1 \times 10⁻⁷, and the partial sp. vol., 0.73, giving a calc. mol. wt. of 263,000. Catalase contains 4 Fe per mol. L. S. T.

Synthesis of cocarboxylase (vitamin-B₁ pyrophosphate) from vitamin-B₁. H. TAUBER (J. Amer. Chem. Soc., 1938, 60, 730—731).—The cocarboxylase is best obtained by heating vitamin-B₁ hydrochloride with Na₄P₂O₇—H₃PO₄ (previously heated according to directions) at 155° for 15 min.; dissolving in cold water, adjusting to *p*_H 6.2, and buffering at this *p*_H gives a solution of a substance having activity of the same order as the natural product. R. S. C.

Schardinger enzyme [of milk]. G. SCHWARZ and O. FISCHER (Milch. Forsch., 1938, 19, 260—270).—The enzyme is conc. 200—500-fold by washing cream with 0.9% aq. NaCl successively until the centrifuged washings are only slightly turbid, churning the cream into butter, adsorbing the enzyme in the buttermilk on Al(OH)₃ and eluting with aq. Na₂HPO₄ at *p*_H 8.2. In milk the enzyme is adsorbed on the surface of fat globules. In conc. form the association of a brown colouring matter with the enzyme can be observed. The colour could not be separated by ultrafiltration or dialysis. Spectrographic analysis showed that the colour bore no relation to lactoflavin, carotene, or hæmin and its derivatives. W. L. D.

Unsaponifiable matter of algal fats. IV. Lipase activation as influenced by pelvesterol. K. SHIRAHAMA (J. Agric. Chem. Soc. Japan, 1938, 14, 349—351; cf. A., 1937, III, 503).—The lipolytic action of pancreatic lipase is increased by pelvesterol. J. N. A.

Action of lipase at low temperatures. A. K. BALLS and I. W. TUCKER (Ind. Eng. Chem., 1938, 30, 415—416).—Pancreatic lipase (pig) hydrolyses triolein and tributyrin at a measurable rate at low temp. (—25°) and no sudden change in rate of hydrolysis is observed corresponding with the change in state. A. T.

Action of enzymes at low temperatures. A. K. BALLS and H. LINEWEAVER (Food Res., 1938, 3, 57—67).—Solutions of chymotrypsin, pepsin, trypsin, and carboxypolypeptidase were scarcely affected by freezing at —186° for 44 hr. At —6.7° their activity is approx. 1%, at —17.8° less than 0.1% of that at 30°. Some activity is demonstrable in the solid state at —6°. Lipase action proceeds at low temp. and in the frozen state. The times for 5% splitting of olive oil by pancreatic lipase at temp. between 40 and —30° are tabulated. E. C. S.

Effect of sodium glycocholate on the saponification of glycerides by pancreatic extract. K. HOLWERDA (Biochem. Z., 1938, 296, 1—12; cf. A., 1937, I, 418; 1938, I, 135).—At alkaline reaction very small amounts of Na glycocholate counteract the reduction, caused by Na salts of fatty acids, in the rate of saponification of glycerides by the extract. Larger amounts of glycocholate act thus also under some conditions but only when salts of higher fatty acids are present, the curve showing the rate then exhibiting two max. when increasing amounts of glycocholate are added. Probably the glycocholate facilitates the adsorption of lipase on the surface of fats, some lipase being subsequently removed from the surface by the soap-glycocholate complex unless large amounts of glycocholate are added. W. McC.

Enzymic hydrolysis of nucleotides and nucleosides. II. Further purification of nucleotide-N-ribosidase. Y. KOMITA (J. Biochem. Japan, 1938, 27, 23—33; cf. A., 1936, 1556).—Nucleotide-N-ribosidase (A., 1938, III, 72) is separated from nucleosidase by adsorption on Fe(OH)₃, the latter being readily eluted by aq. PO₄''' solution at acid, neutral, or alkaline reactions for short periods and the former

being subsequently eluted by prolonged elution with aq. Na_2HPO_4 . Other adsorption methods of separating the two enzymes are indicated. Calf's spleen contains the nucleosidase and, to a smaller extent, the ribosidase. Previous observations (e.g., Klein, A., 1935, 510) that purified nucleosidase does not rupture the sugar linking of nucleotides is confirmed; the related conclusion that there exists no enzyme capable of this hydrolysis is refuted by the occurrence of nucleotide-*N*-ribosidase.

F. O. H.

Enzymic histochemistry. XXVII. Peptidase and catalase activity of marine ova. W. L. DOYLE (J. Cell. Comp. Physiol., 1938, 11, 291—300).—Unfertilised eggs of the sea-urchin and fertilised eggs with the external membrane destroyed gave more catalase activity than fertilised eggs with the membrane intact. Peptidase activity was the same under all conditions.

V. J. W.

Hæmopoietin, anti-anæmic principle in hog's stomach. III. Interaction of hæmopoietin and pepsin with myoglobulin and caseinogen. T. S. G. JONES, W. S. M. GRIEVE, and J. F. WILKINSON (Biochem. J., 1938, 32, 665—675; cf. A., 1934, 1387).—The effect of p_{H} on production of non-protein-N in the interaction of beef muscle-globulin and caseinogen with pepsin and preps. of hog's stomach has been determined. The effect of substrate concn. on hydrolysis of caseinogen by these preps. is in agreement with the theory of Michaelis and Menten for the action of pepsin, and with Haldane's modification of the theory for an inhibited reaction in the case of one particular fraction (P_{S}) of the stomach preps. The Michaelis const. for the former reaction is 0.316 mg. of N per ml. or 0.20% of caseinogen whilst for the latter K_1 and K_2 are 0.398 and 17.78 mg. of N per ml., respectively. Hæmopoietin is not identical with pepsin and there is a possibility that it acts not on protein but on a protein degradation product. The bearing of the results on the nature of the enzyme is discussed.

J. N. A.

Proteolysis by mould enzymes. J. BERGER, M. J. JOHNSON, and W. H. PETERSON (J. Bact., 1937, 33, 104).—Enzymes from animal sources effect proteolysis to the extent of 85—90% of that produced by acid hydrolysis. With mould enzymes the corresponding val. was 60—70%. Enzymes from *Aspergillus parasiticus* caused 85% proteolysis of lactalbumin, ovalbumin, edestin, casein, gliadin, and zein. With gelatin the hydrolysis was more complete with dil. than with more conc. solutions, and addition of erepsin to the hydrolysate effected little additional breakdown.

A. G. P.

Bacterial enzymes. I. Proteolytic enzymes of gelatin-liquefying bacteria. II. Proteolytic enzymes of non-gelatin-liquefying bacteria. M. IMAIZUMI (J. Biochem. Japan, 1938, 27, 45—64, 65—79).—I. The proteolytic action of *B. subtilis*, *B. proteus vulgaris*, *B. prodigiosus*, *B. pyocyaneus*, and *Staphylococcus* types on caseinogen, gelatin, and peptone was investigated. Maceration juices, aq. glycerol extracts, and Chamberland-filtered bouillon of the bacteria were used. In general, all three substrates are hydrolysed, the optimum p_{H} being 7—8, although

hydrolysis also occurs at weakly acidic reactions. A trypsin-like exoenzyme is evident. The maceration juices and aq. glycerol extracts of the dry bacteria hydrolyse leucylglycyl- and glycyl-glycine and glycyl-*l*-phenylalanine at p_{H} 7—8; that the bouillon filtrates have no peptidase activity indicates these hydrolyses to be due to an erepsin-like endoenzyme. Benzoyl-glycylglycine is hydrolysed by the maceration juice only of *B. prodigiosus* (optimum p_{H} 8—9) and *S. pyogenes* whilst chloroacetylphenylalanine is hydrolysed by the juice of all the bacteria examined (*S. pyogenes* having optimum p_{H} 7).

II. Under the above conditions, *B. dysenteriae*, *B. typhosus*, *B. paratyphosus* A and B, *B. enteritidis*, Gaertner, *Sarcina* types, and *B. coli communis* have no hydrolytic action on caseinogen or gelatin; only large amounts of fresh *B. coli* show a proteolytic action. The maceration juices of fresh strains or extracts of the dried bacteria hydrolyse peptone and di- and tri-peptides. Bouillon filtrates (except those of *B. dysenteriae* and *B. typhosus*) hydrolyse peptone but not peptides whilst only the maceration juices hydrolyse chloroacetyl-*l*-phenylalanine. The bacteria examined do not possess acylase activity.

F. O. H.

Determination of protein degradation products. W. HAARMANN (Biochem. Z., 1938, 296, 121—130).—A modification, suitable for determining the extent of the breakdown of proteins by enzymes (pepsin, trypsin, cathepsin) of the method of Kober and Sugiura (A., 1912, i, 953) is described. Carbohydrates are first removed by pptn. with CuSO_4 and $\text{Ca}(\text{OH})_2$. In slightly alkaline media the peptides produced by the action of cathepsin combine with each other to form larger mols.

W. McC.

Effect of non-specific agents on post-mortal autolysis. W. HAARMANN and E. SCHROEDER (Biochem. Z., 1938, 296, 131—148).—Study of the extent of protein degradation of the liver, kidney, and skeletal and cardiac muscle of the rabbit during autolysis at p_{H} 3.9 and 7.36 and in unbuffered solutions shows that autolysis is most pronounced in the kidney, slightly less in the liver, moderate in cardiac muscle and very slight in skeletal muscle. The degree of autolysis is not affected by injecting horse-serum, thyroxine, or hypertonic salt solution containing iodophenol into the rabbits. No conclusions concerning protein degradation in the living organism can be drawn from the study of the autolysis of surviving organs. Increased protein degradation is due not to increased activity of proteolytic enzymes but to changes in the medium and particularly to increased acidity.

W. McC.

Chemical nature of taka-amylase. II. Mol. wt. of taka-amylase. S. AKABORI and K. KASIMOTO (Bull. Chem. Soc. Japan, 1938, 13, 291—298; cf. A., 1937, III, 180).—From taka-amylase are prepared fractions with mol. wt. 1990, 1550, 540, and 490, respectively, as determined by the diffusion method, concns. being evaluated by the unimol. rate of formation of maltose from amylose. This rate is unimol. only at low concn. and for short times. The low mol. wts. exclude protein as a constituent of the enzyme.

R. S. C.

Influence of heavy water on amylase formation in barley. M. L. CALDWELL and S. E. DOEBBELING (J. Biol. Chem., 1938, 123, 479—483).—D₂O in 1% and 10% concn. has no appreciable effect on germination of barley or generation of amylases during germination; 100% D₂O has a marked unfavourable influence on these processes, the effect being more pronounced with α - than with β -amylase. This effect of D₂O appears to be exerted on the formation or stability of the enzymes rather than on their action in hydrolysing starch. J. N. A.

Influence of temperature on the amylases of cold- and warm-blooded animals. C. L. SMITH (J. exp. Biol., 1938, 15, 10—17).—Under standard conditions the optimum temp. of amylase is the same in frog and man. Between 10° and 20° frog amylase is 30% more effective than ptyalin. The rate of digestion at 0° is about equal in both amylases. In the period in which the frog normally retains food in its gut, the amylase is thermostable and there is no relation between the period of digestion and the heat-inactivation of the enzyme. J. M. R.

Degradation of starch by α -amylase.—See A., 1938, II, 221.

Specificity of disaccharide-splitting enzymes. J. LEIBOWITZ and S. HESTRIN (Nature, 1938, 141, 552—553).—After being heated to the b.p., solutions of certain taka-maltase preps. lose their ability to split sucrose and their slight hydrolytic activity towards α -methylglucosides, but retain or regenerate after the heating most of their ability to split maltose. Hence, the inversion of sucrose by taka-diaxase is not due to taka-maltase, but to a distinct taka-sucrase. After incubation with taka-diaxase, yeast maltase solution fails to hydrolyse either α -methylglucoside or maltose. The hydrolytic activity of taka-maltase towards maltose is not removed under these conditions. Taka-diaxase thus contains an inhibitor for yeast glucosido-maltase which is heat-labile, non-dialysable, and distinct from taka-maltase. L. S. T.

Enzymic hydrolysis of triethylcarbinol β -D-glucoside. Steric hindrance; its significance in the hydrolysis of glucosides.—See A., 1938, II, 220.

"Phosphosaccharomutase." S. IRI (J. Biochem. Japan, 1938, 27, 7—22).—The phosphohexokinase of Tankó (A., 1936, 910) is named "phosphosaccharomutase." With glucose and fructose monophosphates, the enzyme yields an equilibrium mixture of 70% of the aldose and 30% of the ketose. The distribution of the enzyme in animal tissues was determined; muscle, liver, and kidney are good sources. Optimum conditions are 37° and p_H 7 and 8 for purified and crude preps., respectively. Purified preps., obtained by adsorption of impurities by kaolin or adsorption of the enzyme by Al(OH)₃ followed by elution with 0.1M-Na₂HPO₄, converts glyceraldehyde- into dihydroxyacetone-phosphoric acid but has no action on glucose 3- or ribose 3- or 5-phosphate. F. O. H.

Function of "activators" and nature of donators in pigeon's breast muscle. I. BANGA and A. SZENT-GYÖRGYI (Z. physiol. Chem., 1938, 252, P P (A., III.)

275—282).—The action of the activator (cf. A., 1938, III, 71) in enzyme systems containing various substrates indicates that the activator is not a triose-mutase or α -glycerophosphate-mutase or -dismutase but appears to be a triose phosphate- (and α -glycerophosphate-)dehydrase. Hexose diphosphate produces in the enzyme-co-enzyme-activator system an O₂ uptake generally slightly greater than that with α -glycerophosphate. The O₂ uptake of the system in presence of oxalacetic or pyruvic acid indicates the independent donator nature of α -glycerophosphate. Hexose diphosphate in muscle extracts is primarily split into triose phosphate and is mainly dehydrogenated in this form. F. O. H.

Conditions for stability of cozymase in apozymase systems. A. LENNERSTRAND (Naturwiss., 1938, 26, 235).—Various facts relating to the inactivation of cozymase during shaking with apozymase indicate that PO₄''' transport as well as oxidation-reduction processes are necessary for its stability. The possibility that cozymase takes part in both these activities is consistent with the views of Ostern *et al.* (A., 1938, III, 343). W. O. K.

Enzymic dephosphorylation of cozymase. N. B. DAS and H. VON EULER (Nature, 1938, 141, 604—605).—Cozymase is slowly dephosphorylated by nucleotidase which dephosphorylates adenylic acid and inosic acid much more rapidly. Dihydrocozymase is dephosphorylated approx. twice as fast as cozymase. This is attributed to the dibasic character of the former. L. S. T.

(v) MICROBIOLOGICAL AND IMMUNOLOGICAL CHEMISTRY.

Effect of respiratory stimulating factors on endogenous respiration of yeast. E. S. COOK, M. J. HART, and R. A. JOLY (Proc. Soc. Exp. Biol. Med., 1938, 38, 169—170).—A respiration-stimulating factor extracted from yeast increases by 150—250% the O₂ uptake of living yeast cultures whether in the presence or absence of glucose. V. J. W.

Three metabolic stimulating factors. R. J. NORRIS and C. W. KREKE (Stud. Inst. Divi Thomae, 1937, 1, 137—162).—Aq. extract of malt combings was separated into 19 fractions by Lucas' procedure. Each fraction was tested for factors influencing growth, respiration, and fermentation of yeast. Although these factors are of similar mol. size, they are not identical substances; their concn. differs in the various fractions. D. BU.

Action of cysteine in respiration, fermentation, and synthesis in yeast cells. J. RUNNSTRÖM and E. SPERBER (Nature, 1938, 141, 689—690).—Cysteine increases aerobic fermentation of glucose by baker's yeast. It depresses respiration and the synthesis of higher carbohydrates. C. A. K.

Measurement of yeast growth by means of changes in p_H of the nutrient solution. V. HARTELIUS (Planta, 1937, 27, 287—294).—The effect of growth-substance on growth of yeast and on p_H changes in the substrate are quantitatively related only under restricted conditions. Boas' method for

determining the activity of growth-substance on this basis is more generally applicable if comparison is made with a series of cultures to which successively increasing amounts of growth-substance are added.

A. G. P.

Inhibition of yeast growth. H. LÜERS, C. ENDERS, and K. KÄRNBAUGH (Biochem. Z., 1938, 296, 47—52; cf. B., 1937, 278).—Cultivated yeasts resist the toxic action of vanillin more than do wild yeasts. Tolerance to the action is slowly acquired on repeated propagation. The degree of toxicity varies with the ratio of the wts. of yeast and vanillin, being usually directly proportional to the vanillin concn. Mixtures of toxic substances (vanillin with terpineol, menthol, or eucalyptol; terpineol with menthol) exhibit toxicities which are equal to the sum of the toxicities of their components.

W. McC.

Effect of 1:2:5:6-dibenzanthracene on the growth and respiration of yeast. E. S. COOK, M. J. HART, and R. A. JOLY (Science, 1938, 87, 331).—1:2:5:6-Dibenzanthracene (9×10^{-4} M) increases yeast proliferation by about 50%, as shown by the rocker-tube yeast growth technique. A colloidal suspension of dibenzanthracene stimulates respiration in high concns. (3×10^{-4} M) and causes depression in low concns.

C. A. K.

Nitrogen assimilation by yeast. IX. Elimination of nitrogen from yeast at low temperatures. N. NIELSEN and V. HARTELIUS. XI. Influence of the bios growth factor and of metabolic products of yeast on nitrogen assimilation and excretion. V. HARTELIUS (Compt. rend. Trav. Lab. Carlsberg, 1938, Sér. physiol., 22, 195—202, 211—234).—IX. Earlier experiments (A., 1937, III, 270) are repeated, using much larger quantities of yeast for inoculation and lower temp. (8°). Previous results are confirmed. Large quantities of N separate from the yeast during growth and autolysis, that during growth being the greater and equiv. to approx. $\frac{1}{3}$ of the N assimilated.

XI. Assimilation of N is little affected by the bios concn., but elimination of N increases with decreasing concn. of bios, whether this is added in wort or yeast. The ratio surface/depth of liquid has little effect. Acid in the liquor, whether added artificially or produced during fermentation, causes a retardation of growth and leads to smaller elimination of N; ethyl alcohol, however, favours elimination.

I. A. P.

Nucleic acids. VII. Preparation of pyrimidine nucleotides. H. BREDERECK and G. RICHTER (Ber., 1938, 71, [B], 718—720).—Yeast nucleic acid is hydrolysed by 2% H_2SO_4 at 105—110° and the bulk of the guanine is removed as the sulphate. After removal of H_2SO_4 the liquid is evaporated to a syrup to which pyridine is gradually added, thus pptg. cytidylic acid, which is purified through the Pb salt. The uridylic acid in the filtrate is isolated and purified by successive transformations into the brucine, NH_4 , and Pb salts.

H. W.

Effect of E_h and sodium chloride concentration on physiology of halophilic bacteria. L. S. STUART and L. H. JAMES (J. Bact., 1937, 33, 35).—In high-salt media *Sarcina littoralis* occurred

only at low E_h ranges: in low-salt media the growth- E_h range was much wider. On the former media growth was characterised by pigment production and a markedly oxidative metabolism, and that on the latter by a reducing metabolism and absence of pigmentation.

A. G. P.

Comparative effects of growth-substance on different yeasts and moulds. N. NIELSEN and F. S. FANG (Planta, 1937, 27, 367—378).—Growth-substance B in beer wort is separated into B_1 (acting on yeast) and B_2 (acting on *Aspergillus niger*) by shaking with yeast, B_1 being absorbed by the yeast. The amount of B_1 thus removed by yeast is inversely related to the amount of B_1 already present in the yeast. A mixture of pyruvic and glycollic acids acts as a growth-substance for *A. niger*, but not for *Rhizopus sinensis*, *Penicillium Roquefortii*, or various yeasts.

A. G. P.

Rôle of molybdenum in utilisation of ammonium- and nitrate-nitrogen by *Aspergillus niger*. R. A. STEINBERG (J. Agric. Res., 1937, 55, 891—902).—*A. niger* utilised NH_4^+ , NO_3^- , and org. N (urea, asparagine) equally effectively provided the supply of other essential nutrients, notably Zn, Cu, Mn, and Mo, was suitably adjusted. More Mo was required by the organism when NO_3^- than when other forms of N were given. Mo is probably essential for the activity of the NO_3^- -reductase.

A. G. P.

Influence of certain heavy-metal salts on the chemical composition of *Aspergillus niger*. G. SCHULZ (Planta, 1937, 27, 196—218).—The effect of Zn on the composition of *A. niger* varies with the strain and with the age of the culture. Mn, Cd, Fe, and Zn favour the formation of higher carbohydrates from reducing sugars and restrict the production of lignin-like substances. Zn and Cd retard and Mn and Fe stimulate fat formation. All four elements increase dry matter production but to extents which differ considerably.

A. G. P.

Carbon metabolism of *Fusarium lycopersici* on glucose. G. H. PRITHAM and A. K. ANDERSON (J. Agric. Res., 1937, 55, 937—949).—*F. lycopersici* grows in media of p_H 1.9—11.1, substantially good growth occurring in the range p_H 2.0—9.5. The organism tends to change the reaction of the medium towards an intermediate val. approaching p_H 4.2—4.9. Glucose is converted mainly into alcohol and CO_2 but considerable amounts of volatile and non-volatile acids are also formed. The CO_2 /alcohol ratio is approx. that found in yeast fermentations but increases in older cultures through consumption of alcohol by the organism. Alcohol can serve as sole source of C and is probably utilised more effectively than glucose, but is toxic in concns. exceeding 4%.

A. G. P.

Formation of oxidoethylene- α -dicarboxylic acid by moulds. II. K. SAKAGUCHI, T. INOUE, and S. TADA. III. K. SAKAGUCHI and T. INOUE (J. Agric. Chem. Soc. Japan, 1938, 14, 362—365, 366—373; cf. A., 1937, III, 182).—II. The effects of temp. and concn. of glucose on production of the acid by the mould are determined. Citric and fumaric

acids are also produced. The acid is formed also from sucrose, fructose, mannitol, sorbitol, arabinose, xylose, erythritol, β -butylene glycol, and glycerol.

III. The mould belongs to the genus *Monilia* and its morphological characteristics are described. Growth is optimum at about 35° and is inhibited below 9–12° and above 47°. The optimum p_H is 5.1–6.5. J. N. A.

Relative toxicity of the three halides of lithium on green mould (*Penicillium italicum*). B. MELKON (Amer. J. Pharm., 1938, 110, 56–63).—The decreasing order of toxicity is LiI, LiBr, and LiCl. F. O. H.

Specificity of pyrimidine for *Phycomyces Blakesleeanus*. W. J. ROBBINS and F. KAVANAGH (Proc. Nat. Acad. Sci., 1938, 24, 141–145).—The various pyrimidines were added to a medium containing $MgSO_4$, KH_2PO_4 , asparagine, glucose, and the vitamin thiazole, and sterilised. The sterile solutions were inoculated with the spores of *P. Blakesleeanus*. Detailed structural relations are given for the substances tested. W. F. F.

Specificity of thiazole for *Phycomyces Blakesleeanus*. W. J. ROBBINS and F. KAVANAGH (Proc. Nat. Acad. Sci., 1938, 24, 145–147). W. F. F.

Localisation of Ca in *Paramecium caudatum*. A. I. LANSING (Science, 1938, 87, 303–304).—By means of a micro-incineration technique and 2 sp. colorimetric tests it is shown that Ca is conc. in the cortex of *P. caudatum*. C. A. K.

Viability of bacteria in sea-water. S. A. WAXMAN and M. HOTCHKISS (J. Bact., 1937, 33, 85).—Destruction of marine organisms when transferred to fresh water is probably caused by protozoa. The balance between bacteria and animal plankton is disturbed by changes in supply of nutrients and by temp. and aeration. A. G. P.

Influence of solid surface on physiological activities in sea-water. C. E. ZOBELL (J. Bact., 1937, 33, 86).—Bacterial populations of sea-water may increase considerably during storage. Such increases are more marked when the receptacle is small and are attributable to the favourable influence of solid surfaces on bacterial activity. O_2 consumption, denitrification, ammonification, and fermentation of sol. carbohydrates are thus facilitated. Explanations of the effect of solid surfaces are offered. A. G. P.

Conditions controlling the marine bacterial population and its activity in the sea. C. E. RENN (J. Bact., 1937, 33, 86–87).—The low bacterial population of sea-water as compared with fresh waters is attributed to lower concn. of nutrients, lower temp., sedimentation of particulate matter, and the attack of a predatory nannoplankton. A. G. P.

Bacterial luminescence, respiration, and viability in relation to osmotic pressure and specific salts of sea-water. F. H. JOHNSON and E. N. HARVEY (J. Cell. Comp. Physiol., 1938, 11, 213–232).—Suspensions of *Achromobacter fisheri* were made in dil. and conc. sea-water of const. p_H . In dil. media the luminescence falls off in proportion to the dilution,

but the respiration keeps const. until the dilution reaches 50%. In conc. media luminescence is not affected up to 200% but falls off above this point. Respiration is reduced proportionately with the concn. In dilutions below 10% nearly all the cells die after 15–20 min. and in concns. above 300% only 1–2% of them survive. The changes appear due only to osmotic effects and can be reproduced by corresponding solutions of sucrose. V. J. W.

Paradox in the adaptation of marine bacteria to hypotonic solutions. C. E. ZOBELL and H. D. MICHENER (Science, 1938, 87, 328–329).—Old marine bacteria survive transfer from sea-water to fresh water better than young ones. A sudden change is better tolerated than a gradual alteration in the composition of the water. C. A. K.

Adsorbed calcium on colloidal clay and an accessory growth factor in laboratory production of *Rhizobium* cultures. W. A. ALBRECHT and T. M. MCCALLA (J. Bact., 1937, 33, 80–81).—Abnormal forms of *Rhizobium* cultures are transformed into normal forms by Ca^{++} adsorbed on clay. Adsorbed Ba^{++} changed normal to abnormal coloured forms. The clay medium permitted growth at p_H 5.0 and was a more effective source of Ca than was $CaCO_3$ in agar media. Kraut juice contains an accessory growth factor for *Rhizobium* which is more effective than that in yeast. It is sol. in alcohol, dil. acetic acid, and water, passes through collodion, but is inactivated or destroyed by prolonged electro dialysis. A colloidal clay suspended in kraut juice containing sugar is a suitable medium for rapid multiplication of *Rhizobium*. A. G. P.

Differentiation of *Rhizobium* species by physiological methods. O. A. BUSHNELL and W. B. SARLES (J. Bact., 1937, 33, 81–82).—In media containing sugar and NH_4 salts strains of *Rhizobium* from lucerne, clover, pea, bean, and *Dalea* produce acidity, whereas those of the soya bean-cowpea-lupin group cause alkalinity. A. G. P.

Factors affecting the preparation and use of silica gel media for growth of non-symbiotic nitrogen-fixing bacteria. H. W. BATCHELOR (J. Bact., 1937, 33, 83).—Suitable media are described and the effects of various constituents are examined. A. G. P.

Nodule bacteria. VIII. Influence of ash content of the nodule on growth of nodule bacteria with special reference to titanium salts. A. ITANO and A. MATSUURA (J. Sci. Soil Manure, 1936, 10, 63–75; cf. A., 1936, 1301).—Ti compounds improved the growth of the organisms, to extents which depended on the nature of the compound, the strain of bacteria, and the constitution of the medium. CH. ABS. (p)

Bacteria and nitrogen metabolism of termites. R. A. GREENE and E. L. BREZEAL (J. Bact., 1937, 33, 95–96).—Bacteria isolated from a species of *Kaloterms* fixed N_2 in a mannitol solution. The wide C:N ratio of the intestinal contents of the termite should favour N fixation. A. G. P.

Digestion of maize cobs by bacteria. P. A. TETRAULT and J. HURWITZ (J. Bact., 1937, 33, 96).—

Pure cultures of an organism isolated from the gut of a termite fermented maize cobs at 37° yielding acetic, butyric, and lactic acids. A. G. P.

Action of micro-organisms on fats. L. B. JENSEN (J. Bact., 1937, 33, 98—99).—The culture of fat-splitting micro-organisms and the examination of the products of their action are described. A. G. P.

Reduction of elemental sulphur by some autotrophic and heterotrophic micro-organisms. R. L. STARKEY (J. Bact., 1937, 33, 94—95).—No S'' was detectable during the oxidation of S₂O₃'' by *Thiobacillus thio-parus* or during the growth of *T. thio-oxidans* on customary media. Small amounts of S'' were formed in cultures of both organisms and of heterotrophic bacteria, actinomycetes, and filamentous fungi on inorg. media. The S'' produced by autotrophic bacteria arises from hydrogenation of elementary S, probably through interaction of thiol compounds in the cells. It is unlikely that hydrogenation of S precedes its entrance into the cells of *T. thio-oxidans*. A. G. P.

Cellulose decomposition by a bacterial culture from the intestinal tract of termites. P. A. TETRAULT and W. L. WEIS (J. Bact., 1937, 33, 95).—Organisms isolated from the gut of *Reticulitermes flavipes* decomposed cellulose yielding acetic, lactic, and butyric acids, CO₂, small amounts of alcohol, and a trace of a reducing substance. A. G. P.

Butyl-acetonic fermentation of arabinose and other sugars. L. A. UNDERKOFER and J. E. HUNTER, jun. (Ind. Eng. Chem., 1938, 30, 480—481).—During fermentation of arabinose by *Clostridium acetobutylicum*, the solvent ratio (butanol-acetone-ethanol) changes from 40:33:26 to a final val. of 50:40:10, different from that for all other sugars (60:30:10). This is probably due to *l*-configuration of arabinose. *l*-Sorbitose is not fermentable by the organism. A. T.

Wildiers' bios and lactic acid bacteria. Relation of bios to the water-soluble B-vitamins. B. A. EAGLES, O. OKULITCH, and A. S. KADZIELAWA (Canad. J. Res., 1938, 16, B, 46—53).—The influence of three distinct activators prepared from tomatoes; yeast, or liver on the metabolism of two species of lactic acid bacteria is examined. One activator is bios IIA and the others are the components of bios IIB. Their physical and chemical properties suggest that the growth-stimulants required by the bacteria are identical with certain of the heat-stable accessory food factors of the vitamin-B complex essential for the growth of animals. H. W.

Optical activity of lactic acid produced by *Lactobacillus acidophilus* and *L. bulgaricus*. L. M. KOPELOFF, N. KOPELOFF, J. L. ETCHELLS, and E. POSSELT (J. Bact., 1937, 33, 89—90).—The *R* form of *L. acidophilus* produced *dl*-lactic acid at first and the *d*-form later. *S* forms of both organisms gave *d*-acid. Reported inconsistencies may be due to use of cultures containing both *R*, *S*, and intermediate strains. A. G. P.

Effect of certain colloids on endospore formation by *Bac. subtilis*. J. L. ROBERTS and I. L.

BALDWIN (J. Bact., 1937, 33, 37—38).—Hydrophobic colloids (Fe, SiO₂, C) increase sporulation of *B. subtilis* in peptone media. Stimulation is more marked if the colloid is removed from the medium (filtration) prior to inoculation. Peptone probably contains an inhibitory substance which is removed by the colloids. Hydrophilic colloids (agar) are more stimulative to sporulation than are hydrophobes. If rendered hydrophobic by MgSO₄ or alcohol the action of agar is similar to that of C. A. G. P.

Methods for study of lipolysis by micro-organisms. H. F. LONG and B. W. HAMMER (J. Bact., 1937, 33, 99).—The technique of the Nile-blue sulphate test is discussed. It is suitable for the enumeration of lipolytic species and inhibits non-lipolytic types notably cocci. The lower triglycerides (tripropionin, tributyrin) are more easily hydrolysed than natural fats and may give misleading results. The method of detecting lipolysis by the increased opacity of the fat permits plate counting and facilitates isolation of the organisms. A. G. P.

Protein-lipin constitution of acid-alcohol-resisting bacteria. A. SARTORY, R. SARTORY, and J. MEYER (Bull. Soc. Chim. biol., 1938, 20, 173—178).—The extracts obtained from *Grasbacilli* No. II (Moeller) with water at 95°, alcoholic KOH, half-saturated aq. (NH₄)₂SO₄, and acetone-CHCl₃ are separated into the globulin and albumin fractions; determinations are made in these of the protein, fat, fatty acids, unsaponifiable matter, and cholesterol. The globulins with the associated lipins together constitute the acid-alcohol-resisting fraction. A. L.

Bacterial deamination of glycine.—See A., 1938, II, 222.

Production of succinic acid by *Bacterium succinicum* nov. sp. K. SAKAGUCHI and S. TADA (J. Agric. Chem. Soc. Japan, 1938, 14, 374—387).—The morphology and reactions of the organism which produces succinic acid from org. acids are described. The optimum temp. is 33° and optimum *pH* is 6.5—7.0. The % yields of succinic acid from the following acids are: citric 57.83, *d*-tartaric 45.10, *l*-malic 25.04, and fumaric acid 28.60. With glucose as substrate, succinic, lactic, and acetic acids, β -butylene glycol, and alcohol are formed. The production of succinic from citric acid by 17 known strains of bacteria related to *B. succinicum* was investigated. J. N. A.

[Bacterial] fermentation of *d*-arabinose. S. A. KOSER and E. F. VAUGHAN (J. Bact., 1937, 33, 36—37).—Under all cultural conditions examined fermentation of *d*-arabinose by bacteria readily attacking the *l*-form was slow. Repeated transfer to *d*-arabinose media increased the ability of the organisms to ferment this sugar without change in fermentative behaviour towards the *l*-form. The acquired capacity to ferment *d*-arabinose results from changes in the cells and not from conversion of the *d*-form into a more readily assimilable compound. A. G. P.

Bacterial dissimilation. C. H. WERKMAN, R. W. STONE, and H. G. WOOD (J. Bact., 1937, 33, 100—101).—Bacterial dissimilation of glucose is charac-

terised by phosphorylation in the initial stage by the living cell. With a no. of organisms phosphoglyceric acid is produced intermediately and is converted into pyruvic and phosphoric acids. The final stages of dissimilation involve delicately balanced oxidation-reduction equilibria. A. G. P.

Phosphorylation and first stages in glucose breakdown by propionic acid bacteria. R. W. STONE, H. G. WOOD, and C. H. WERKMAN (J. Bact., 1937, 33, 101).—Suspensions of the bacteria cause phosphorylation of glucose in presence of NaF, irrespective of the presence of toluene. The PO_4''' uptake greatly exceeds the equiv. of phosphoglyceric acid obtained. Much of the PO_4''' is probably retained in the form of hexose or triose esters which are assumed to be precursors of phosphoglyceric acid. A. G. P.

Final oxidation-reduction phases of the propionic dissimilation. H. G. WOOD, R. W. STONE, and C. H. WERKMAN (J. Bact., 1937, 33, 102).—The dissimilation process is represented as: glucose \rightarrow hexose phosphate \rightarrow phosphoglyceric acid \rightarrow pyruvic acid \rightarrow acetic acid + CO_2 \rightarrow lactic acid \rightarrow propionic acid. Succinic acid also occurring as an intermediate is probably formed from acetic acid and is in turn converted into propionic acid and CO_2 . A. G. P.

Glucose fermentation with butyric acid bacilli. H. PELDÁN (Suomen Kem., 1938, 11, B, 5).—The amount of butyric acid produced in the fermentation of glucose by the bacilli varies with $[\text{Ca}^{++}]$ (cf. A., 1937, III, 317). Pyruvic acid and trioses occur as intermediates in the fermentation. M. H. M. A.

Action of ultra-violet light on members of the *Pseudomonas fluorescens* group. B. T. DEWEY and C. F. POE (Proc. Soc. Exp. Biol. Med., 1938, 38, 176–177).—The ability to produce pigment is correlated to some extent with the resistance of the organisms to ultra-violet irradiation. V. J. W.

Nitrogen metabolism of certain colon bacteria. P. L. CARPENTER and W. H. PETERSON (J. Bact., 1937, 33, 36).—In the presence of glucose *E. coli* and *Aërobacter aërogenes* utilise considerable amounts of NH_3 in the absence of org. N, but none when org. N is supplied. Both organisms utilise amino- and sol. org. N, the latter being more readily taken up by *Aërobacter* than by *E. coli*. Intermediate strains show less definite tendencies but in general resemble *E. coli* in their utilisation of NH_3 - and peptone-N. A. G. P.

Oxidations and reductions concerned in respiration of bacteria. E. J. ORDAL and H. O. HALVORSON (J. Bact., 1937, 33, 35–36).—Normal strains of *E. coli* possess enzymes which can activate formate and H_2 to reduce methylene-blue, and others which can activate CO_2 to react with H_2 to yield formic acid. In variant strains which are unable to produce gas one or both of these enzymes is lacking. A. G. P.

***Escherichia coli-mutabile* in relation to lactose utilisation.** A. D. DULANEY and C. J. DEERE (J. Bact., 1937, 33, 19).—In broth cultures of strains of *E. coli* from babies suffering from diarrhoea, acid

formation in presence of lactose, raffinose, salicin, and, sometimes, dulcitol is accompanied by formation of red variants. The variants are stable and their appearance in cultures is associated with increased lactase activity, sugar utilisation, and acid formation. A. G. P.

Intermediate reactions in fermentation by *Bacterium coli*. S. ENDO (Biochem. Z., 1938, 296, 56–70).—Determinations of the PO_4''' balance and detection and determination of the intermediate compounds obtained show that, in the fermentation of glucose by very active acetone-dried *B. coli* preps., the reactions which occur and the org. phosphates produced are the same as or very similar to those of alcoholic fermentation by yeast. Pyruvic acid is usually the final product but, if NaF is added, phosphoglyceric acid is produced instead. Added acetaldehyde accelerates the fermentation and is reduced to alcohol. Glycerophosphoric acid does not accumulate as a result of the dismutation of hexose diphosphate. The cozymase content of *B. coli* is double that of yeast. Living *B. coli* converts dihydroxyacetone partly into glycerol, no lactic acid being produced. W. McC.

Bacteriostatic action of brilliant-green in solid media on members of the *coli-aërogenes* group and their intermediates. A. E. HOOK and E. R. HITCHNER (J. Bact., 1937, 33, 88–89).—Use of the dye in differentiation of *Escherichia* from *Aërobacter* strains is indicated. A. G. P.

Factors limiting bacterial growth. II. Growth without lag in *B. coli* cultures. A. D. HERSHEY (Proc. Soc. Exp. Biol. Med., 1938, 38, 127–128).—The bacterial N in a fresh culture increases continuously from the beginning at a greater rate than the nos. of organisms present. The delayed rate of numerical increase is due to increase in size of the individual bacteria. V. J. W.

Function of carbon dioxide in the metabolism of heterotrophic cells. J. W. HES (Nature, 1938, 141, 647).—Oxidation-reduction catalysts of various heterotrophic cells (e.g., *B. coli* or *Bact. prodigiosum*) require CO_2 for normal functioning. C. A. K.

Evidence of a rotational growth factor in *Bacillus mycoides*. J. L. ROBERTS (Science, 1938, 87, 260–261).—Such evidence has been obtained in investigations that confirm the occurrence of spirally-twisted filaments of *B. mycoides*. L. S. T.

Isolation of ascorbic acid-fermenting bacteria. A. I. KENDALL and H. CHINN (Proc. Soc. Exp. Biol. Med., 1938, 38, 8–10).—Broth containing 15–20 mg. of ascorbic acid per 10 c.c. is inoculated with the material to be examined and the growth plated out on glucose agar. The various colonies are then tested on similar broth containing ascorbic acid, which is titrated colorimetrically. The organisms found are of the *lactis-aërogenes* or enterococcus groups. V. J. W.

Pigment of *Chromobacterium iodinium*.—See A., 1938, II, 248.

Chemical constitution of the endo-antigen of *Brucella* cells. R. P. PENNELL and I. F. HUDDLE-

SON (J. Bact., 1937, 33, 42).—A fraction comprising 25% of the wt. of the cells contained the antigenic principle. From the fraction were obtained a diketone, a fat yielding on hydrolysis a fatty acid, m.p. 20–30°, and a solid alcohol (not a sterol), N compounds (tryptophan representing $\frac{1}{3}$ of total N), reducing sugars (after hydrolysis) probably including glucose and arabinose, and a substance (more than 50% of total wt.) giving, on hydrolysis, an optically inactive hexonic acid and anthraquinone-2-carboxylic acid or a homologue thereof. A. G. P.

Culture of *Clostridium chauveii* and preparation of a vaccine for symptomatic anthrax. L. A. MARTIN (Compt. rend. Soc. Biol., 1938, 127, 1059–1061).—Culture on a transparent peptone-liver medium and prep. of the vaccine are described. H. G. R.

Utilisation of carnosine by *B. diphtheriae*. J. H. MUELLER (J. Biol. Chem., 1938, 123, 421–423).—*B. diphtheriae* can utilise *l*- but not *d*-carnosine to obtain the β -alanine necessary for growth. P. G. M.

Growth and toxin production of diphtheria bacillus in synthetic media: effect of inorganic salts and carbohydrates. M. W. WHEELER (J. Bact., 1937, 33, 54).— Mg^{++} , P , Na^+ , and K^+ were necessary for adequate growth of the organism. With increased proportions of Na^+ and K^+ growth was not affected provided both were present in sufficient quantity. Toxin production was greater in media of high $[Na^+]$ than when part of the Na^+ was replaced by K^+ . Ca^{++} was essential for toxin production but not for growth. The energy source present influenced production of toxin. A. G. P.

Absorption and fluorescence spectra of diphtheria toxin broth. C. DHÉRE and V. CASTELLI (Compt. rend. Soc. Biol., 1938, 127, 1050–1054).—The absorption spectrum is similar to that of a hæmochromogen and is probably due to a Zn complex of coproporphyrin. H. G. R.

Action of aldehydes on purified diphtheria toxin. M. D. EATON (J. Bact., 1937, 33, 52–53).—Incubation of the toxin with formaldehyde (0.3%) at p_H 8.6 causes detoxication with some loss of flocculating and immunising properties, suggesting destruction of toxoid. The latter is avoided by incubation at p_H 6.2. Modification of toxin to toxoid by 1% hexamethylenetetramine occurs at p_H 6.0–9.0 without loss of antigenic properties, the detoxication being more rapid in acid solution. Acetaldehyde-ammonia acts similarly at p_H 7.8 but only very slowly at p_H 6.5. Acetaldehyde bisulphite and formaldehyde-sulphoxylate act much more slowly than the corresponding NH_3 compounds. Aldol detoxifies but destroys antigenic properties. Alkaline glucose solution resembles aldehyde in its action. A. G. P.

Disappearance of diphtheria anatoxin action in presence of antidiphtheria serum. A. BESREDKA (Compt. rend., 1938, 206, 380–381).—Anatoxin injected alone into guinea-pigs exerted full immunising power but was without any action when injected just after a dose of antidiphtheria serum. T. F. D.

Absorption of antidiphtheric and antitetanic antitoxin by different precipitins. T. HIKI (J. orient. Med., 1938, 28, 24).—Tetanus and diphtheria antitoxin react in the same way with the following precipitins: (1) P.V.At., (2) P.V.Ab. (Pn), (3) P.V.Ab. (Dys), and (4) P.V.Ap. (1) is prepared with floccules of diphtheria-toxoid-antitoxin and (2) with the sp. ppt. of pneumococcus S.S.S. (3) is the precipitin versus anti-Shiga-dysenteric antibody and (4) that versus anti-protein produced by immunising rabbit with the ppts. by goat serum and anti-goat horse serum. P. C. W.

Effect of formaldehyde on pneumococci. R. J. DUBOS (J. Exp. Med., 1938, 67, 389–398).—In presence of small concns. of formaldehyde autolysis of pneumococci is somewhat accelerated, but with large concns. (0.5%), the bacteria are killed and autolysis is inhibited. If the formalised pneumococci are washed free of formaldehyde, partial autolysis then proceeds; the bacteria change from a Gram-positive to a Gram-negative character and become smaller, but do not disintegrate completely. The autolytic enzyme is reversibly inactivated by formaldehyde, the treated bacteria being only partly lysed by the enzyme. If the enzyme is irreversibly inactivated by heat or maintained inactive in acid or alkaline reaction, the formalised cells remain unaltered. Gram-positive formalised pneumococci elicit type-sp. carbohydrate antibodies in rabbits, but if autolysed so as to become Gram-negative they fail to do so. W. O. K.

Presence of a type- and species-specific conjugated polysaccharide in type I pneumococcus. M. G. SEVAG (Science, 1938, 87, 304–305).—A polysaccharide (N 6-35, P 2-78, reducing sugar 23.0%), identical with that isolated previously (A., 1934, 1406), has been isolated from strictly Gram-positive, young organisms of type I grown in beef broth containing catalase to remove the H_2O_2 produced. In dilution of 1 to 10^6 this polysaccharide gives ppts. with univalent horse sera of types I, II, and III. The results obtained indicate that in actively growing Gram-positive pneumococcus the type- and species-sp. carbohydrates exist in a combined complex form. As this complex alone or mixed with swine serum produced no immunity in rabbits it is assumed that it may be in an antigenically active union with a protein component in the organism as the complete antigen. L. S. T.

Reactions of pneumococcal hæmolysin with certain sterols. B. COHEN and H. SHWACHMAN (J. Bact., 1937, 33, 67–68).—Digitonin-precipitable sterols (cholesterol, *allo*cholesterol, coprosterol) actively inhibited the lysis. Digitonin-negative substances (cholesterone, ψ -cholesterone, cholesteryl acetate) were much less active in this respect. Reversibly inactive lysis (air-oxidised and capable of reactivation by cysteine or H_2S) is unaffected by cholesterol. Active lysis, similarly treated, cannot be reactivated. The OH in position 3 of the sterol mol. is responsible for its reaction with lysis. The active lysis, but not the reversibly active form, contains the thiol group, which remains unchanged after reaction with chole-

sterol. Evidence is advanced which indicates that red-cell sterol attaches the lysin preceding hæmolysis.

A. G. P.

Immunological studies of polysaccharides of encapsulated bacillus. I. Isolation from smooth *B. rhinoscleromatis*. II. Isolation from rough *B. rhinoscleromatis*. S. C. WONG. III. Active sensitisation with polysaccharide from *B. rhinoscleromatis*. T. J. KUROCHKIN and S. C. WONG (Proc. Soc. Exp. Biol. Med., 1938, 38, 107—110, 110—113, 113—116).—I. A method is described for preparing a polysaccharide by acid extraction of the organisms. This derivative gives a positive complément-fixation reaction in dilutions of 1 : 50,000. Polysaccharides prepared by alkaline extraction gave negative results.

II. The same hydrolysis methods were used as for the smooth strain, and two polysaccharides were prepared; of these the product of acid hydrolysis was the more active immunologically.

III. Guinea-pigs sensitised with the polysaccharide made by acid hydrolysis of the organisms showed anaphylactic shock when injected either with this polysaccharide or with the one resulting from alkaline hydrolysis. The latter polysaccharide caused no sensitisation either to itself or to the acid product.

V. J. W.

Agglutinin content of eggs from hens infected with *Salmonella pullorum*. N. A. FRANK and B. H. EDGINTON (Poultry Sci., 1937, 16, 442—444).—Presence of agglutinins is demonstrated in the yolk but not in the white of eggs from infected birds.

A. G. P.

Filterability of the Chinese strain of *Spirochaeta recurrentis*. H. L. CHUNG (Proc. Soc. Exp. Biol. Med., 1938, 38, 23—26).—These spirochaetes can be seen in blood plasma which has passed through Berkefeld V and N filters, and similar plasma passed through a W filter can cause relapsing fever and spirochaetosis in the squirrel though no spirochaetes are visible in it.

V. J. W.

Chemical analysis of *Staphylococcus aureus* and a rough variant. W. M. CLARK (J. Bact., 1937, 33, 20—21).—Fractional extraction of both forms yielded a phospholipin, and an albumin fraction (comprising portions of low total and high dibasic-N contents), seven metaprotein fractions, and a non-extractable residue. Two alcohol-sol. portions were obtained from the *S* and one from the *R* strain. The yield of extractable matter varied with p_H , being max. at p_H 7.0 and, in the case of *S* strains, a secondary max. with 0.1N-NaOH. The % N extracted was min. at p_H 6.5 and max. in 0.1N-NaOH, *S* strains yielding higher proportions than *R* strains. Amide-, dibasic-, and non-amino-N fractions were higher at low p_H , whereas humin- and monoamino-N were higher at higher p_H of extraction.

A. G. P.

Classification of staphylococci by precipitation and biological reactions. S. T. COWAN (J. Path. Bact., 1938, 46, 31—45).

W. L. D.

Bi-phasic nature of certain alpha-prime (?) hæmolytic streptococci. R. R. MELLON and F. B. COOPER (Proc. Soc. Exp. Biol. Med., 1938, 38, 158—160).—A strain of hæmolytic streptococcus, when

grown on proteose-peptone blood-agar at p_H 6, assumed certain characters of *S. viridans*, but reverted to the original hæmolytic type on a medium of p_H 8.

V. J. W.

Type-specific antigen of *Streptococcus hæmolyticus* (group A). S. MUDD, E. J. CZARNETZKY, H. PETTIT, D. LACKMAN, and E. W. FLOSDORF (J. Bact., 1937, 33, 63—64).—A labile, type-sp., N-containing substance is isolated from 8 types of group A hæmolytic streptococci and from the products of their disintegration by sonic vibration or by lyophile drying and grinding. The substance is probably Griffith's typing agglutinin. Lancefield's *M* substance may be a derivative. The labile substance is sol. in 70% alcohol, from which it may be recovered without loss of combining capacity. It is inactivated by cold storage for 3 days, by heating at 56° for 30 min., by treatment with 1% formaldehyde, exposure to p_H 10, or by peptic digestion. It passes a Berkefeld filter. A hæmolysin isolated from β -hæmolytic streptococci has mol. wt. 2260, and contains N and P in the mol. ratio 3 : 1. A. G. P.

Diminution in the pathogenic activity of some strains of bacteria grown in lecithin media. B. S. LEVIN and L. OLITZKI (Compt. rend., 1937, 205, 1261—1264; cf. A., 1932, 1067).—Different strains of typhoid and dysentery bacilli, subcultured 10 times in a broth containing 0.1% of lecithin and injected into mice, diminished the % of fatalities from 20% (no lecithin) to 10%. After 110 subcultures in broth containing 2% of lecithin, the corresponding figures were 68% and 6% (0.5 c.c. injected) and 28% and 0% (0.1 c.c. injected). Similar results are obtained if the lipins of the broth are removed. Lecithin diminishes the pathogenic power to a smaller extent if the animals are injected with larger nos. of bacteria.

J. L. D.

Modified Kline reaction as exclusion test in serodiagnosis of syphilis. T. T'UNG (Chinese Med. J., 1937, 52, 857—864).—43,690 specimens of blood were tested by the Wassermann, Kahn, and modified Kline reactions. The results are analysed in detail. The Kline reaction showed 0.72% false positives and 0.88% false negatives.

P. C. W.

Value of the Kline test on spinal fluid. F. C. LIN (Chinese Med. J., 1937, 52, 865—870).—522 specimens of spinal fluid were tested by the Kolmer technique and by a slightly modified Kline technique. The results were in agreement in 95% of cases.

P. C. W.

Test for infectious mononucleosis. I. DAVIDSON (Amer. J. clin. Path., Tech. Suppl., 1938, 2, 56—59).—The presumptive sheep-cell agglutinin test together with the differential absorption test are described.

C. J. C. B.

Titration of antigangrenous sera (antisera for *B. perfringens* C and D, *B. histolyticus*, and *Vibrio septique*). M. WEINBERG and M. GUILLAUME (Compt. rend. Soc. Biol., 1938, 127, 1084—1088).—Results for the anti-toxic titration vary if different samples of homologous toxins are used.

H. G. R.

Specific precipitinogenic substances extracted from non-pathogenic acid-fast bacilli. S. NAITO

(Jap. J. exp. Med., 1938, 16, 53—63).—Sp. precipitinogenic substances were extracted by 0.05N-HCl at 100° for 15 min. The purified substances gave sp. precipitin reactions with their respective immune sera prepared by injection of bacilli into rabbits. The sera from strains which formed dry growths were of low titre in contrast with the high titre of sera from bacilli with moist growth. The precipitinogenic substance was a true hapten and not antigenic. Strains indistinguishable by quant. pptn. tests were closely related biologically, but some moist growth strains, indistinguishable biologically, could be separated by their precipitin reactions. C. J. C. B.

Treatment of scarlet fever with specific antitoxins of low protein content. J. A. TOOMEY and C. S. BAKER (J. Pediat., 1938, 12, 439—448).—In the treatment of 922 cases of scarlet fever with 3 different kinds of recently prepared conc. and refined scarlet fever antitoxins, it was found that the serum reaction rate following the administration of 2 of them was decidedly decreased compared with the rate following the use of the old type of antitoxin. C. J. C. B.

Mechanism of precipitin reaction. II. Fractionation of immunologically pure precipitin. K. LEE, B. F. CHOW, and H. WU (Proc. Soc. Exp. Biol. Med., 1938, 38, 101—103).—By fractional pptn. with $(\text{NH}_4)_2\text{SO}_4$, an immunologically pure precipitin of type 1 pneumococcus can be separated into two portions having isoelectric points respectively above and below p_H 7.6. V. J. W.

Immunological study of serum-proteins treated with ninhydrin. W. L. DULIÈRE (Compt. rend. Soc. Biol., 1938, 127, 1122—1124).—After treatment with ninhydrin, serum-proteins behave as a new type of antigen, having lost their species-specificity. H. G. R.

Theory of the origin of bacteriophage. R. W. GLASER (Amer. J. Hyg., 1938, 27, 311—315).—It was not possible to produce bacteriophage in sterile houseflies by establishing in their alimentary tracts a non-lysogenic staphylococcus susceptible to bacteriophage. The evidence is against the possibility of the formation of bacteriophage by an interaction between the bacteria and their host. G. P. G.

Effect of bacteriophage on strepto-fibrinolysin production. R. R. MADISON (Proc. Soc. Exp. Biol. Med., 1938, 38, 129—131).—The addition of bacteriophage to the cultures destroys the susceptible organisms but allows the growth of a phage-resistant strain with equal or greater lysin production. V. J. W.

Approximate size of viruses and bacteriophages as determined by ultrafiltration. M. PAÏC, D. KRASSNOFF, P. HABER, L. REINIÉ, and J. VOET (Ann. Inst. Pasteur, 1938, 60, 227—269).—The size of several different species of viruses and bacteriophages was estimated by a modification of Elford's method of ultrafiltration through graded collodion membranes. Possible errors due to variation in initial virulence or lytic activity, the nature of the medium in which the virus or bacteriophage was suspended, and, in the case of viruses pathogenic for more than one species, the nature of the animal on which the filtrate was tested were pointed out. In

most cases the medium used for suspension was unimportant. The extreme variation in size between different viruses and bacteriophages fully establishes their plurality and specificity. Exact vals. for the size of a virus or bacteriophage cannot be obtained by the above method. G. P. G.

Carbohydrate matrix of the epithelial cell inclusion in trachoma. C. E. RICE (Amer. J. Ophthalmol., 1936, 19, 1—8).—The inclusion body probably contains glycogen. CH. ABS. (p)

Nature of viruses. T. E. RAWLINS and W. N. TAKAHASHI (Science, 1938, 87, 255—256).—Recent evidence that appears to favour the animate nature of viruses is discussed. L. S. T.

Separation of plant viruses by chemical inactivation. W. B. ALLINGTON (Science, 1938, 87, 263).—The addition of aq. solutions of certain salts to the extracts of certain combined viruses effects a separation by sp. inactivation. The cucumber mosaic virus withstands higher concns. of AgNO_3 and HgCl_2 than the potato ring spot virus, whilst the latter withstands higher concns. of KMnO_4 , Li_2CO_3 , or CuSO_4 . When mixtures of these two viruses are treated with 0.1—0.9% aq. KMnO_4 , 1% aq. Li_2CO_3 , or 2% aq. CuSO_4 , only the potato virus remained infective to *Nicotiana tabacum*. $[\text{H}^+]$ does not appear to be correlated with inactivation. L. S. T.

Possibility of separating mixed viruses on the basis of their different p_H -stability. G. A. KAUSCHE (Naturwiss., 1938, 26, 219).—The separation of tobacco mosaic virus and the X- and Y-viruses of the group of potato mosaic viruses by varying the p_H of the medium has been investigated. The potato viruses were inactive in a medium of p_H below 3.2, and at p_H 1.5 after 7 days only the tobacco virus remained active. At p_H 4.75—7.5 there was no effect on either type of virus. In the alkaline range the tobacco virus became rapidly inactive whilst the potato virus retained its activity. A. J. M.

Physiology of plant viruses. K. M. FRANKE (Biochem. Z., 1938, 296, 149—152; cf. A., 1937, III, 489; Kausche, A., 1938, III, 249).—Polemical. W. McC.

Relation between serological reaction and infectivity of potato virus "x." F. C. BAWDEN (Brit. J. Exp. Path., 1935, 16, 435—443).—The antigen content of suspensions of S strains of the "x" virus (flocculation of antisera) and their virus content (lesion production) are closely related. Inactivation of the virus (heat, ageing, alcohol) was accompanied by loss of ability to flocculate antisera. Inactivation by formaldehyde did not affect the flocculating power; that by phenol lowered but did not prevent flocculation. Antigen and virus behaved similarly to various precipitants. CH. ABS. (p)

Protein content of mosaic tobacco. L. F. MARTIN, A. K. BALLS, and H. H. MCKINNEY (Science, 1938, 87, 329—330).—A method developed for distinguishing between trypsin-resistant virus protein and normal proteins without recourse to extraction of the tissue depends on the observation that virus protein is not attacked by crude trypsin. In general, it consists of determining total N, and N sol. in 10%

trichloroacetic acid before and after digestion with commercial trypsin. Results obtained with three varieties of tobacco and three mosaics show that (i) total N of the plants is practically unchanged irrespective of the severity of the disease, (ii) the total protein undergoes little change, suggesting that virus protein is produced at the expense of normal protein, and (iii) in the common mosaic, the trypsin-resistant protein exists in a smaller proportion than hitherto supposed. The amount of resistant protein in a susceptible variety of tobacco exceeds that in those considered to be less vulnerable. L. S. T.

Inactivation of ordinary tobacco-mosaic virus by micro-organisms. J. JOHNSON and I. A. HOGGAN (Phytopath., 1937, 27, 1014—1027).—Numerous bacteria and fungi inactivate the virus, the process being accelerated in some cases by aëration of the cultures. Aëration (or agitation) of sterile virus preps. does not reduce their infectivity. Exclusion of O_2 from moist virus-infected soil markedly retards or prevents inactivation probably by restricting microbiological action. A. G. P.

Influence of various chemicals on inactivation of tobacco virus. J. C. WENT (Phytopath. Z., 1937, 10, 480—489).—The virus is inactivated by aq. $CuSO_4$, $HgCl_2$, or $AgNO_3$ (0.25—1.0%), the effect being accentuated when the virus prep. is diluted, prior to addition of the chemicals. Dilution of virus and chemical after admixture results in reactivation of the virus except in the case of $AgNO_3$. A. G. P.

Ultracentrifugation of the proteins of cucumber viruses 3 and 4. W. C. PRICE and R. W. G. WYCKOFF (Nature, 1938, 141, 685—686).—Photographs of the ultra-centrifugal sedimentation of these two viruses are reproduced. In a field of 40,000g acting for 30 min., two highly-infectious, heavy components are almost completely separated. Fresh preps. of the proteins of cucumber viruses 3 and 4 give sedimentation diagrams indistinguishable from each other and from that of unaltered tobacco mosaic virus protein. Sedimentation consts. at 20° are 173×10^{-13} cm. sec.⁻¹ dynes⁻¹ for the virus 3 protein, 175×10^{-13} for the virus 4 protein, and 174×10^{-13} for the tobacco mosaic virus protein. The cucumber virus proteins differ from unaltered tobacco mosaic protein in being practically insol. in H_2O . The presence in cucumber plants of a homogeneous high mol. wt. substance other than the virus protein has been demonstrated. L. S. T.

Specificity of "bios" preparations for bacteria. J. R. LOOFBOUROW, R. J. NORRIS, and M. N. MORGAN (Stud. Inst. Divi Thomae, 1937, 1, 193—195).—"Bios" preps. from (a) yeast (Narayanan's method) and (b) malt combings (methods of Lucas) were added to broth growths of 6 different bacteria. With exception of "bios" from acetone ppt. of malt combings on hæmolytic streptococci, all preps. gave parallel results ranging from marked stimulation to complete inhibition. D. Bu.

Immunisation and sensitisation of micro-organisms by oligodynamic action of metals at a distance. A. BERTUZZI (Bull. Soc. Chim. biol., 1938, 20, 382—386).—Exposure of *Holotricha* to Pb

in a closed space causes vacuolisation, loss of movement, and finally dissociation of the cells. If the organisms are removed after vacuolisation, they return to normal in a few hr. The organisms can be rendered less sensitive by exposure in an open space. J. N. A.

Inhibition of bacteria by quinhydrone. D. P. GLICK and L. L. GEE (J. Bact., 1937, 33, 34—35).—Benzoquinone, quinhydrone, and quinol inhibited bacterial activity to extents which decreased in the order named. The bearing of this on determinations of p_H or E_h is indicated. A. G. P.

Effect of sodium chloride on the E_h of proto-genous media. L. S. STUART and L. H. JAMES (J. Bact., 1937, 33, 32).—Addition of high $[NaCl]$ to media of initially high p_H lowered the E_h irrespective of the amount of salt present. Marked variations were produced with initial p_H 5.64—5.74. Steam-sterilisation of gelatin and peptone solutions of high salt content involves considerable oxidation, the extent of which influences that occurring on subsequent treatment with H_2O_2 . Addition of a reducing agent (cysteine hydrochloride) to sterilised peptone solution effects a decrease in E_h which is slightly diminished by salt additions regardless of concn. A. G. P.

Selective medium for *B. medicaginis*, var. *phaseolicola* (Burkholder), Link and Hull. R. S. WILSON (J. Austral. Inst. Agric. Sci., 1938, 4, 47—49).—A method for detecting seed infection with this organism using a medium containing Na taurocholate, glycerol, NH_4NO_3 , and gentian-violet is described. H. G. R.

Ultra-microscopic photographs of bacteria. B. VON BORRIES, E. RUSKA, and H. RUSKA (Wiss. Veröff. Siemens-Werken, 1938, 17, 107—111).—Cocci show no internal structure when examined with 60—70 kv. electrons. *Bac. coli* show a remarkable variety of form, density, and inner structure. Pseudo-diphtheria bacilli have a characteristic and easily recognised form. Besides bacteria, the photographs show various forms smaller than 10μ , which differ in appearance when near bacteria. They are probably products of metabolism. J. W. S.

Detection of hydrogen sulphide in [bacterial] cultures. C. A. HUNTER, M. FELDMAN, and G. CRECELIOUS (J. Bact., 1937, 33, 31—32).—"Bismuth liquor" (Bi citrate-aq. NH_3) and Bi NH_4 citrate U.S.P. were more sensitive than aq. Fe salts (Fe^{III} NH_4 citrate) for detecting H_2S . A. G. P.

(w) PLANT PHYSIOLOGY.

Viability of stored *Lilium* pollen. N. E. PFEIFFER (Contr. Boyce Thompson Inst., 1938, 9, 199—211).—For seed production, storage of pollen for long intervals (1 year) under reduced pressure at 5° or -5° is preferable to storage in vac. at 20° . Storage at -10° in a gelatin capsule wrapped in paraffin paper is better than in either capsule or paper alone. Storage at 10° in R.H. 35, 50, and 65% is also recommended for seed production. The control of humidity by means of saturated aq. $MgCl_2$, $CaCl_2$, and K_2CO_3 gave as good results as did H_2SO_4 . Aq. $Mg(NO_3)_2$ and $Na_2Cr_2O_7$ preserved viability in lesser

degree; KCNS ranked with these for storage of *Amaryllis* pollen. AUTHOR.

Parasitism of *Polyporus schweinitzii* on seedling *Pinus strobus*. R. E. WEAN (Phytopath., 1937, 27, 1124—1142).—In sand cultures root and shoot growth was directly related to the p_H and P and N supply in the media. Low P was a limiting factor in growth, whereas diminution of N was not unfavourable. Increase of p_H (to 7.0) diminished the intake of Ca and P and inoculation with the fungus lowered the Ca content of the plants. Parasitism increased with the p_H of the nutrient and with decrease in P supply. In liquid cultures the fungus produced an acid (possibly succinic) in amounts which appreciably increased the acidity of nutrient solutions. A. G. P.

Transport of substances in plants. H. H. DIXON (Proc. Roy. Soc., 1938, B, 125, 1—25).—A lecture. F. B. P.

Stomatal movement and epidermal water content. (A) F. J. NUTMAN. (B) D. THODAY (Nature, 1938, 141, 608).—(A) The hypothesis advanced previously (A., 1938, III, 245) does not explain the unusual stomatal behaviour of coffee leaves.

(B) The above criticism is accepted. L. S. T.

[Determination of] free water in plant tissue. G. W. HAMMAR (Science, 1938, 87, 263—264).—A calorimetric method is described. L. S. T.

Absorption of ions by plants. M. KORCZEWSKI (Acta Biol. Exp., 1937, 11, 332—347).—A lecture. R. T.

Changes in hydrogen-ion concentration in the growing apple. O. EINSET (Gartenbauwiss., 1937, 11, 319—323).—In several apple varieties the p_H of extracts of the fruit diminishes steadily from the unopened bud stage until full bloom, then increases sharply for a period of approx. 5 weeks, and subsequently declines slightly to a fairly const. level throughout later development. Minor differences among varieties and others due to climatic conditions are indicated. The decrease in p_H after flower formation is somewhat more rapid in cross-pollinated than selfed fruit. A. G. P.

Ageing phenomena in the intermicellar substance of young stretchable [plant] membranes. U. RUGE (Planta, 1937, 27, 436—449; cf. A., 1938, III, 159).—Elongation of cells is accompanied by changes in porosity of the membranes, and a modification of intermicellar substance represented by conversion of water-sol. pectin into an insol. form. The former, but not the latter, responds to growth-substance. Protopectinase causes a reversion of the insol. pectin rendering it more reactive to the growth-substance. Chemical changes in membranes with age are discussed. A. G. P.

Changes in osmotic condition and membrane properties of hypocotyls of *Helianthus annuus* during normal growth by cell extension. U. RUGE (Planta, 1937, 27, 352—366).—Osmotic vals., suction force, and turgor pressure in plant tissues are min. in the zone of most rapid growth by cell-stretching. Cell-stretching is accompanied by diminution in

acidity of the membranes. The increase in cell extensibility under these conditions is not due to p_H changes alone; the anion of the growth-substance probably regulates the swelling of the colloids. A. G. P.

Buffering of press juice of degenerated and healthy potato tubers. H. WARTENBERG (Phytopath. Z., 1937, 10, 44—56).—Press juice from degenerated tubers and haulm was more strongly buffered than that from healthy tubers and plants. Tobacco plants infected with both X- and Y-virus, but not those with either virus alone, showed abnormally high buffer capacity in the press juice. A. G. P.

Comparison of nutrient salt solutions for the cultivation of excised tomato roots. P. R. WHITE (Growth, 1937, 1, 182—188).—The relative efficiencies of 17 salt solutions as nutrient media for isolated tomato roots were determined. The standard solution used in the author's laboratory (Rockefeller Institute) gives the most satisfactory results. All satisfactory solutions have p_H below 6.0 and all unsatisfactory solutions have p_H above 6.0. Beijerinck and Tyrode solutions are greatly improved by acidification. W. F. F.

Growth of pineapple plants in complete water cultures with either ammonia or nitrate salts. C. P. SIDERIS and B. H. KRAUSS (Growth, 1937, 1, 204—210).—Two groups of plants were grown in a watery solution of nutrient material, one with NH_4^+ and the other with NO_3^- as a source of N. In both cases the measurements made during growth fit the equation of the autocatalytic unimol. reaction, viz., $\log [x/(A - x)] = K(t - t_1)$. W. F. F.

Saline excretions of plants. A. SANFOURCHE and B. TALLIBART (Compt. rend. Acad. Agric. France, 1937, 23, 999—1002).—Plants were grown in sand cultures and the K contents of samples determined at intervals. K is progressively absorbed to a max. and then excreted by the roots. This excretion is not related to the grain formation or development but to the decrease in vitality of the plant, independent of its vegetative stage. With P_2O_5 this is less marked. A. W. M.

Potentials in *Halicystis* as affected by non-electrolytes. W. J. V. OSTERHOUT (Proc. Nat. Acad. Sci., 1938, 24, 75—79).—In the study of potentials of *Halicystis* in varying dilutions of sea-water, non-electrolytes are added in order to maintain the osmotic pressure of the medium. For this purpose mannitol is found more suitable than glycerol, glucose, sucrose, and maltose, with which the potential changes are so great that some alteration of protoplasmic surface is indicated. W. F. F.

Binding of calcium, strontium, and barium by *Elodea* protoplasm. D. MAZIA (J. Cell. Comp. Physiol., 1938, 11, 193—203).—Ca contained in cell protoplasm is detected by causing it to be deposited as Ca oxalate crystals in the cell vacuoles. Various stimulating agents have this effect. Ca is not removed from the cell by 14 days' immersion in distilled water but is removed by dil. solutions of K citrate and replaced by addition of $CaCl_2$. It combines with the cell in the same amount, irrespective of the concn. of

the solution, and can be replaced by Sr or Ba. Salts of Mg, K, or Na cause the disappearance of Ca from the protoplasm when present in sufficient concn.

V. J. W.

Penetration of radioactive potassium chloride into living cells. S. C. BROOKS (J. Cell. Comp. Physiol., 1938, 11, 247—252).—Cells of the alga *Nitella clavata* were placed in a solution containing a known quantity of radioactive KCl. After 8½ hr. the sap, protoplasm, and cell wall were mounted on slides and the quantity of radioactive K present in each was determined by a Geiger-Müller counter. It accumulates first in a high concn. in the protoplasm, from which it later diffuses into the sap.

V. J. W.

Effects of potassium cyanide on the penetration of certain oxidation-reduction dyes into living cells. M. M. BROOKS (J. Cell. Comp. Physiol., 1938, 11, 253—258).—KCN in 0.076M concn. had no effect on the penetration of methylene-blue into the cells of *Valonia*. In concn. 0.038M it delayed the penetration of dibromophenol-indophenol and of neutral-red, but it did not affect the oxidation-reduction potential of the cell in any concns. tried.

V. J. W.

Utilisation of sulphate in the synthesis of glutathione by potato tubers following treatment with ethylene chlorohydrin. J. D. GUTHRIE (Contr. Boyce Thompson Inst., 1938, 9, 233—238).—The increase in glutathione in potato tissue following treatment with the chlorohydrin is accompanied by a decrease in SO_4^{--} . This is due to utilisation of SO_4^{--} -S in the synthesis of glutathione by the tissue. Part of the S enters a compound other than glutathione.

AUTHOR.

Evidence that plant tissue forms a chlorine-containing β -glucoside from ethylene chlorohydrin. L. P. MILLER (Contr. Boyce Thompson Inst., 1938, 9, 213—221).—Ethylene chlorohydrin adsorbed by potato or gladiolus tissue under conditions which have been found to break the rest period undergoes changes resulting in the formation of a compound which is hydrolysed by emulsin. The products of hydrolysis are a volatile org. Cl compound and a reducing substance (? sugar), $[\alpha]$ changing toward the right. The compound formed is probably a β -glucoside. Glucoside formation by plant tissue serves to render less active an introduced chemical.

AUTHOR.

Accumulation of methylene-blue in plant cells. I. H. DRAWERT and S. STRUGGER (Ber. deut. bot. Ges., 1938, 56, 43—54).—The intake by, and distribution in, cells of *Allium cepa* is dependent on the $[\text{H}^+]$ of the external medium. The crit. p_{H} range of penetration of the vacuole membrane is 11—11.5 for cells of resting and 9—10 for cells of active bulbs. In the former a uniform diffuse colouring appears; in the latter the dye is distributed in droplet or cryst. form. Effects of buffer solutions on the penetration of the dye are examined.

A. G. P.

Bacterial symbiosis of leguminous plants. A. DEMOLON and A. DUNEZ (Compt. rend., 1938, 206, 701—703).—Lucerne and soya grown in sterilised sand and in soil free from *B. radiculicola* have a slightly lower N content and are formed in much lower yield

than when symbiotic bacteria are present. Bacteriophages in the nodules of lucerne lyse *B. radiculicola* growing in a variety of plants; those of the lupin, pea, and clover are less active in this respect. Many crops grown on a soil "fatigued" by lucerne give yields of 40—50% of those of controls; after a few weeks, *B. radiculicola* is replaced by the non-sp. bacteriophage in the root nodules.

J. L. D.

Mechanism of symbiotic nitrogen fixation: hydrogen as a specific inhibitor. W. W. UMBREIT and P. W. WILSON (J. Bact., 1937, 33, 79—80).—Commercial H_2 inhibits N fixation in nodules of red clover. The inhibition is a sp. action of H_2 and is not due to accompanying impurities.

A. G. P.

Nitrogenous manure and yield of hydrocyanic acid from Rosaceae. R. SALGUES (J. Pharm. Chim., 1938, [viii], 27, 339—348).—HCN is determined by Denigès' modification of Liebig's method in leaves of Rosaceae. The dry wts. of leaves increase with age. For the same branch, the leaves at the base have a higher dry wt. content than those at the centre or extremity. Young leaves from the middle of the branch contain more HCN than those at either end. At the time of florescence, the HCN content increases but decreases at fructification. Manuring with $(\text{NH}_4)_2\text{SO}_4$ has little effect on the HCN content of leaves.

T. F. D.

Starch formation in leucoplasts of *Phaseolus vulgaris*. P. YOUNG (Bull. Torrey Bot. Club, 1938, 65, 1—8).—Vacuole-like central areas of very young leucoplasts contain an aldehydic carbohydrate. Starch grains originate within these areas.

A. G. P.

Distribution of nutrient substances in tobacco. II. Proteins. I. D. VLĂDESCU (Z. Unters. Lebensm., 1938, 75, 340—346; cf. A., 1938, III, 157).—The distribution of protein in the leaves of three varieties of tobacco at maturity, and in the leaves, stem, root, and flowers of one variety at various stages of development, is recorded. As reported previously, the % of protein increases continuously from the lowest to the highest leaf. The inflorescence is the organ richest in protein.

E. C. S.

Sexual difference of proteins from hemp leaves. A. KIESEL and W. PACHEWITSCH (Bull. Soc. Chim. biol., 1938, 20, 293—300).—The proteins extracted from male hemp leaves contain more arginine, lysine, and alanine, but less histidine, proline, and monoamino-dicarboxylic acids, than those from female leaves.

J. N. A.

Mechanism of the "copper test" for degenerated potatoes. H. BECHHOLD and F. ERBE (Phytopath. Z., 1937, 9, 259—295).—Pyrocatechol-glycine is the most sensitive reagent for oxidase in potato tuber. Tyrosine is less sensitive. The tyrosinase content of outer layers of the tuber is greater than that of the interior. The oxidase content does not differentiate between healthy and degenerated tubers. Pulp from the outer layer of cooked potatoes contains more melanin-producing substances (tyrosinase test) than does that from central portions. Reaction between melanin components and tyrosinase is uninfluenced by Cu. The cooked press juice of

potatoes on heating with HCl yields a brown coloration which may be related to the vitality of the tubers. The dissolution of Cu from soil in the "Cu test" and its influence on the destruction of the cells are discussed. A. G. P.

Dehydrogenase action of healthy and degenerated potatoes. H. WARTENBERG and G. LINDAU (Phytopath. Z., 1937, 9, 297—324).—Under specified conditions the press juice of degenerated potatoes decolorises methylene-blue solution more rapidly than does that of healthy tubers. Factors influencing this action and its utility in testing seed potatoes are discussed. A. G. P.

Enzymic variations in vine shoots. E. EMLIANI (Annali Chim. Appl., 1938, 28, 87—94).—The contents of peroxidase, oxidase, catalase, pectase, and invertase in vine shoots decrease rapidly during the first year of growth and then more slowly during the succeeding years. No evidence of migration of the enzymes was obtained. F. O. H.

Enzymic histochemistry. XXIII. Distribution of amylase in external layers of barley grain. K. LINDERSTRÖM-LANG and C. ENGEL (Compt. rend. Trav. Lab. Carlsberg, 1938, Sér. Chim., 21, 243—258).—The aleurone cells of ungerminated barley are poor in amylase. Approx. 20% of the total amylase of the grain is located in the limiting layer between the aleurone cells and the starch cells of the endosperm. This is exclusively β -amylase, but only approx. $\frac{1}{3}$ is in the active condition. During germination, there is a slight increase in amylase content, but little change in the ratio total: active amylase. α -Amylase appears in the limiting layer. I. A. P.

Respiratory complex of resting seeds and separation of the co-enzyme by ultrafiltration of extracts of seeds of *Pisum sativum*. D. BACH (Compt. rend. Soc. Biol., 1938, 127, 1063—1065).—Ultrafiltration of extracts yields the co-enzyme in the filtrate and the apodehydrogenases and endogenous donors in the residue. H. G. R.

Biochemical methods of altering the germination and growth of cress seeds. I. External factors and salts. B. LUSTIG and H. WACHTEL (Biochem. Z., 1938, 296, 13—27).—The rate of germination of the seeds is not appreciably affected by light, by small changes in pH , by immersion for several days in abs. alcohol, ether, or acetone or in 1—2% ethereal solutions of stearic or oleic acid, cholesterol, or lecithin, by treatment with solutions of salts of many inorg. and org. acids (alkaline-earth salts and some heavy-metal salts decrease the rate) or NH_2 -acids, urea, glucose, or glycerol if the concn. is not greater than 0.025M, or by treatment with proteins, nucleic acids, glycogen, cholic acid, or dextrin in concns. not greater than 25 mg. per 7 c.c. Germination is retarded by temp. above or below 25°. *meso*-Inositol, β -indolylacetic acid, and β -alanine in relatively high concns. do not affect the rate of germination although they inhibit growth. Very low concn. of indole and much higher concns. of β -indolylpropionic acid and *L*-N-methylindole, or 2-methylindole inhibit germination, the effective

concn. increasing with increasing length of side chain. W. McC.

Influence of the water of Badgastein thermal springs on carbon dioxide assimilation of various aquatic plants. F. BUKATSCH (Sitzungsber. Akad. Wiss. Wien, I, 1937, 146, 17—34).—The photosynthesis of the alga *Spyrogyra*, the moss *Fontinalis*, and the mono-cotyledonous aquatic plant *Elodea* was increased by the Badgastein thermal water, whilst respiration and photosynthesis of the alga *Vaucheria* were depressed. Rn-free thermal water showed a similar but not so pronounced effect on the first three plants as did ordinary Rn-containing thermal water; addition of extra Rn further increased the photosynthesis of *Fontinalis*. The protoplasm of *Spyrogyra* kept in thermal water had a smaller viscosity than that of plants kept in tap-water. H. W. K.

Light factor in crop production. B. N. SINGH, G. P. KAPOOR, and R. S. CHOUDHRI (Proc. Indian Acad. Sci., 1938, 7, B, 143—160).—Variation of time of illumination of several crop plants grown under standard conditions shows that sub-normal growth is obtained with less than 12 hr. light a day, while for optimal growth different species require different durations of illumination. Max. grain formation takes place with the use of min. light energy per unit of wt. Plants having simple end-products require less light energy than those with more complex ones. E. M. W.

Effect on the growth of *Lemna minor* of alternating periods of light and darkness of equal length. H. DICKSON (Proc. Roy. Soc., 1938, B, 125, 115—123).—Relative rate of increase of dry wt. is max. in continuous light. With 12 hr. and with 5 min. alternations of light and darkness the rate of increase was lower, but efficiency of illumination was higher, than under continuous illumination. The rate was lowest with 1 min. alternations, and was higher with 5 sec. than with 12 hr. alternations. Curves of relative rate of increase in frond no. and of the average wt. per frond were similar to those for rate of dry-wt. increase, except that the rate in 5 sec. did not differ significantly from that in 12 hr. alternations. Decrease in growth rate at 1 min. alternations is as marked in *Lemna* as in cucumber plants (Portsmouth, Ann. Bot., 1937, 1, 175), therefore stomatal closure is probably a secondary effect rather than the cause of drop in growth rate. Plants subjected to 1 min. alternations have a much different appearance from plants under other conditions of illumination, and the change takes place comparatively suddenly. F. B. P.

Effect of light and atmosphere on development of plant pigments. W. A. BECK (Stud. Inst. Divi Thomae, 1937, 1, 217—244).—Seedlings (Hubbard squash and sunflower) exposed for various times (6—113 hr.) to compressed air (24 lb. excess) in the dark grew better, were more turbescent, and contained more water than controls grown at atm. or under 24 lb. excess pressure of O_2 or CO_2 . Non-irradiated seedlings had no chlorophyll but xanthophyll increased with age. Irradiated plants under 24 lb.

excess air pressure developed more pigment than controls, depending in general on length of exposure. The amount of chlorophyll in experimental and control plants was similar for 6 hr. exposures, but longer exposures up to about 70 hr. markedly increased chlorophyll in experimental seedlings.

D. BU.

Relation between development of chlorophyll and time of exposure to light. W. A. BECK, R. REDMAN, and M. PETRONELLA SCHROEDER (Stud. Inst. Divi Thomae, 1937, 1, 245—251).—At atm. pressure and const. temp. and illumination the amount of chlorophyll developed by sunflower seedlings is a linear function of the time of exposure up to about 70 hr. Thereafter up to 100 hr. exposure the amount of chlorophyll formed per 1000 cotyledons per hr. is consistently lower than the mean val. given for exposure under 70 hr. This decreased rate of formation may be due to saturation of the cotyledons with the pigment.

D. BU.

Phototropism and carotenoids. III. Fungi and higher plants. E. BUNNING (Planta, 1937, 27, 581—610).—The rôle of carotene in *Phycomyces* and *Pilobolus*, and of chlorophyll and carotene in green plants, in controlling phototropic bending by selective absorption of light in different spectral zones is examined. Carotene may act as a sensitiser in the photo-oxidation of auxin.

A. G. P.

Effect of fast neutrons on dry seeds. R. M. CHATTERS (Science, 1938, 87, 262—263).—Bombardment of dry seeds by stray neutrons from a cyclotron produced a decrease in germination proportional to the duration of exposure in certain species, whilst in others it had no effect. Some of the numerous morphological variations in plants grown from bombarded seeds, e.g., in *Myosotis* and in *Antirrhinum*, are discussed. A decrease in size and strength of plants is the most common feature.

L. S. T.

Effects of viruses on Turkish tobacco plants. W. M. STANLEY (Phytopath., 1937, 27, 1152—1160).—Tobacco and aucuba mosaic stimulate protein metabolism in tobacco plants, and although the plants are stunted the total protein produced is above normal, probably through formation of high-mol. virus protein. All other viruses examined diminished protein formation. No direct correlation was apparent between the protein content of plants and the severity of disease symptoms.

A. G. P.

Phytohormones. J. DUFRENOY (Ann. Agron., 1937, 7, 410—430, 547—566).—A review.

A. W. M.

Biological significance of vitamins and hormones in plants. N. BEZSSONOFF (Compt. rend. XVII Cong. Chim. Ind., 1937, 881—890).—A review.

W. McC.

Nicotinic acid and tobacco metabolism. R. F. DAWSON (Science, 1938, 87, 257).—Large and apparently sp. influences of nicotinic acid on the degree and the duration of leaf turgidity, the rates of uptake of solution and of dry wt. accumulation, and the postponement of permanent wilting have been observed in tobacco plants cultured with their cut

stems in dil. aq. solutions of nicotinic acid hydrochloride.

L. S. T.

Growth-substance in degenerated potatoes. H. JAHNEL (Phytopath. Z., 1937, 10, 113—117).—Pulp of young degenerated tubers contains approx. 30% less growth-substance than does that of healthy tubers. Leaf stems of degenerated plants are less sensitive to the action of growth-substance.

A. G. P.

Determination of the [plant] cell-division hormone by means of *Saccharomyces cerevisiae*. K. RIPPEL (Planta, 1937, 27, 381—391).—Fresh tissue from all parts of *Pisum sativum*, but not stored seed, contains a substance which suppresses the growth of *S. cerevisiae*. The substance is partly or wholly destroyed by treatment of extracts with acid or alkali, or by prolonged heating in boiling water. Dried seed but not fresh tissue of *Vicia faba* also contains a somewhat similar toxic agent. The bearing of these facts on the technique of the yeast method of hormone determinations is discussed.

A. G. P.

Activation and inactivation of growth-substance and its significance in regulating germination. H. VOSS (Planta, 1937, 27, 432—435).—Growth-substance is inactive in the scutellum of maize seeds but becomes active in the endosperm. Regulation of germination by destruction of the inactivating substance is discussed.

A. G. P.

Fasciation in *Phaseolus multiflorus* and growth-substance. M. TUTSCHOVÁ (Planta, 1937, 27, 278—286).—Fasciation of seed leaves of *Phaseolus* is inhibited by treatment with heteroauxin, and increased by inactivation of the natural growth-substance, e.g., by eosin, or X-irradiation.

A. G. P.

Parthenocarp of gladiolus induced by β -indolylacetic acid. P. HAGEMANN (Gartenbauwiss., 1937, 11, 144—150).— β -Indolylacetic but not phenylacetic acid induced the formation of parthenocarpic fruits in gladiolus.

A. G. P.

Growth-substances in relation to the mechanism of the action of radiation on plants. H. W. POPP and H. R. C. McILVAINE (J. Agric. Res., 1937, 55, 931—936).—Turnip seedlings exposed to the filtered radiation of a Hg-vapour lamp contained less growth-substance than did controls kept in darkness. Diminution in growth-substance on irradiation was greater in shorter λ . Stunting of plants by irradiation is probably due in part to inactivation of growth-substance.

A. G. P.

(x) PLANT CONSTITUENTS.

Determination of the boron content of plants grown in the same soil. G. BERTRAND and L. SILBERSTEIN (Ann. Agron., 1937, 7, 505—507; cf. A., 1936, 605; B., 1937, 713).—The B contents of several crops and weeds are reported. Gramineae contain less than 5 mg. and legumes 15—70 mg. B per kg. dry matter.

A. W. M.

Biochemistry of silica. A. VIEHOEVER and S. C. PRUSKY (Amer. J. Pharm., 1938, 110, 99—120).—The distribution of Si and its determination in plant

and animal tissues is discussed. Analytical data and microscopical observations of Si in *Cocos nucifera*, *Cardamom*, and in *Equisetum hiemale* are recorded. The last-named contains considerable proportions of therapeutically active sol. SiO_2 . Part of the Si in the epidermis of *Equisetum* is probably in org. combination. A. G. P.

Mineral content of pollen of *Typhla latifolia*. L. J. TISCHER and W. ANTONI (Z. physiol. Chem., 1938, 252, 234—237).—The dried pollen of *T. latifolia* contains K 1.244, N 3.827, P 0.406%, and small quantities of Na, Ca, Mg, Fe, Mn, S, Si, and Cl. J. D. R.

Correlation of organic and mineral matter in mulberry leaves. II. K. KATO and S. NEGI (J. Agric. Chem. Soc. Japan, 1938, 14, 284—288; cf. A., 1936, 1434).—The K_2O and P_2O_5 contents are correlated with that of crude protein, and that of Na_2O with the carbohydrate sol. in HCl (d 1.15). Carbohydrate is not increased by addition of Na_2O to the soil, whilst addition of Na_2O , K_2O , or P_2O_5 increases the protein. J. N. A.

Constituents of the shell and pulp of the nuts of the "Dum" palm. I. UBALDINI and L. BISSI (Annali Chim. Appl., 1938, 28, 57—68; cf. B., 1933, 113).—Data for the contents of water, sugars, fats, cellulose, lignin, N, water-sol. substances, and ash are tabulated. The pulp and shell yield 9.5 and 3.5% of glucose and 17.5 and 2.1% of sucrose, respectively. Pentoses occur in the pulp. F. O. H.

Chemistry and pharmacology of *Cannabis sativa*, Panama. L. S. MALOWAN (Arch. Pharm., 1938, 276, 150—154).—*C. sativa* yields to alcohol 4.8% of a resin, closely related to cannabis oil from other sources. The yield is increased by pretreatment of the dried plant with 5% HCl. The plant contains a wax, but neither paraffins nor alkaloids. The activity of the resin is relatively small; administration to dogs (0.04 g. per kg.) causes only symptoms of fatigue. J. D. R.

Inhibition of peroxidase action on guaiacum resin.—See A., 1938, I, 316.

Starches of wild plants. S. M. STREPKOV and C. K. KURAMSHIN (J. pr. Chem., 1938, [iii], 150, 186—196).—The appearance, ash content, hygroscopicity, d , amylopectin content, and ease of hydrolysis of the starch of 10 wild plants are determined. In general, small size and high amylopectin content lead to ready hydrolysis. R. S. C.

Orientation in young cotton fibres as indicated by X-ray diffraction studies. W. A. Sisson (Contr. Boyce Thompson Inst., 1938, 9, 239—248).—At different ages the X-ray diagrams of cotton fibres show a considerable degree of variation in orientation. In general, fibres younger than about 25 days give the X-ray pattern of randomly oriented cellulose; between approx. 25 and 35 days there develops a preferred orientation which does not change appreciably with further wall thickening. The type of orientation in all cases consists of a preferred orientation with reference to the fibre axis. There is no evidence of a selective orientation with reference to the surface of the cell wall. The pattern of waxy

materials, which is superimposed on that of cellulose in fibres younger than about 35 days, shows a preferred orientation in some samples. Drying under tension improves the orientation of fibres showing a preferred orientation, whilst those showing a random orientation are not appreciably affected. Films and fibres prepared under tension from purified cellulose show a preferred orientation in all samples, regardless of the age of the fibres from which the cellulose was obtained. In mature fibres, the degree of orientation declines in the order Pima, Super Seven, Acala. The possible relationship of this to physical properties and fibre abnormalities is pointed out. AUTHOR.

Occurrence of cardio-active substances in Magnoliaceae. R. JARETZKY and W. LIER (Arch. Pharm., 1938, 276, 138—149).—The relative abundance of alcohol-sol. "digitaloids" in the bark, leaves, and flowers of 15 varieties of magnolia, 2 magnolia hybrids, and of *Michaelia fuscata*, *Liriodendron tulipifera*, *Kadsura japonica*, *Drymis winteri*, *Schizandra chinensis*, and *Talauma pumila*, and in the berries of two varieties of *Illicium*, is examined. The quantities are highest in *Magnolia acuminata*, and in an isolated specimen of *M. stellata*, Max. The yield of "digitaloids" is subject to seasonal variation, being highest in the summer months. J. D. R.

Carotenoids of fresh-water algæ. V. Carotenoids of *Hematococcus pluvialis*. II. J. TISCHER (Z. physiol. Chem., 1938, 252, 225—233; cf. A., 1938, III, 360).—The dry culture of the red spores of *H. pluvialis*, extracted with acetone followed by repeated chromatographic adsorption on CaCO_3 , yields a substance, $\text{C}_{72}\text{H}_{108}\text{O}_8$, m.p. 101° (hydrolysed by KOH-methyl alcohol into euglenrhodon, and palmitic acid), two waxes, α - and β -carotene, and hæmatoxanthin. J. D. R.

Eschscholtzianthin : xanthophyll from petals of the Californian poppy (*Eschscholtzia californica*).—H. H. STRAIN (J. Biol. Chem., 1938, 123, 425—437).—Two methods are given for obtaining eschscholtzianthin, $\text{C}_{40}\text{H}_{54}\text{O}_2$, m.p. 185 — 186° , $[\alpha]_{D}^{18} +225 \pm 12^\circ$ in CHCl_3 , from the Californian poppy. It contains 12 double linkings and 2 OH-groups. Approx. 2—3 g. of crude product are obtained from 3 kg. of fresh poppy petals; this can be purified by crystallisation from acetone, pyridine, dioxan etc., or by chromatographic absorption on MgO , and shows max. in alcohol at 446, 472, and 503 m μ . The crystals absorb O_2 up to 20% in 20 hr., but in solution in pure dimethylaniline oxidation does not take place even on addition of hæmin. The mol. spectral absorption coeffs. of the diacetate, decomp. 200 — 240° , $[\alpha]_{D}^{20} +132^\circ$ in CHCl_3 , dipalmitate, m.p. 100 — 110° , dibenzoate, m.p. 133° , $[\alpha]_{D}^{20} -142^\circ$ in CHCl_3 , di-p-nitrobenzoate, m.p. $>260^\circ$, $[\alpha]_{D}^{20} -234^\circ$ in CHCl_3 , and dioleate, non-cryst., have been determined. P. G. M.

Colouring matter of sugar cane called Badilla. Y. OSIMA and R. YAMAMOTO (J. Agric. Chem. Soc. Japan, 1938, 14, 392—396).—The pigment (isolation described) is similar to cyanidin chloride but differs from it in absorption spectrum and by its conversion into an insol. substance like phlobaphen by treatment

with acids. The pigment may be related to the quercetylene chloride of Nierenstein (A., 1930, 1189).

Constituents of pyrethrum flowers. Chrysanthin.—See A., 1938, II, 239.

Yellow pigment from the osage orange (*Maclura pomifera*, Raf.).—See A., 1938, II, 239.

Anthocyanin pigment in the rind of the sugarcane (*Purple mauritius*).—See A., 1938, II, 241.

Breeding of non-poisonous primulas of the *obconica* type. II. Primine content of *Primula obconica* cultivated varieties. A. STOREK (Gartenbauwiss., 1937, 11, 151—158).—The primine content of 17 varieties is recorded. Nestler's micro-method (primine sulphate) gives results in general agreement with those of the gravimetric method of Maurer and Storek (*ibid.*, 1936, 10, 1). A. G. P.

Pinco-pinco (*Ephedra andina*). S. A. T. CHÁVEZ (Bol. Soc. Quím. Peru, 1937, 3, 198—210).—*E. americana*, var. *andina*, known to the Peruvian Indians as pinco-pinco, yields 0.38% of *l*- ψ -ephedrine. F. R. G.

(y) APPARATUS AND ANALYTICAL METHODS.

Modification of Krogh's "bicycle ergometer." M. NIELSEN and E. FRIDRICHSEN (Skand. Arch. Physiol., 1938, 78, 76—82).—Krogh's "bicycle ergometer" has been modified so that the person working the pedals sits in an armchair instead of on a saddle. A. S.

Measuring infants and children. Choice of measurements, equipment, and technique. P. H. LI, P. T. CHU, and P. H. STEVENSON (Chinese Med. J., 1937, 52, 549—570).—A detailed description of the authors' routine. P. C. W.

Improved tissue culture chamber. G. ZECHER (Science, 1938, 87, 264). C. A. K.

Preparation of pathological specimens from animal tissues and their mounting under watch-glasses. J. S. BENGSTON (U.S. Dept. Agric. Circ., 1938, No. 454, 13 pp.).—Methods of fixation, colour restoration, preservation, mounting, and sealing of specimens are described. A. G. P.

Photomicrographic motion pictures. A. S. WELCH (J. Amer. Med. Assoc., 1938, 110, 552—554).—A simple method is described by which coloured motion pictures may be made through an oil-immersion microscope lens. R. L. N.

Apparatus for studying effects of low concentrations of gases on plants and animals. C. SETTERSTROM and P. W. ZIMMERMAN (Contr. Boyce Thompson Inst., 1938, 9, 161—169).—Apparatus described has been used for studying the effects of long exposure to [SO₂] from 0.10 to 60 p.p.m. With minor changes the apparatus can be adapted to study the effects of other gases, e.g., CO₂, ethylene, Cl₂, HCl, and NH₃. AUTHOR.

Errors of flow-meters and the advantages of a new type of construction. R. K. SCHOFIELD (Proc. Roy. Soc. Med., 1938, 31, 443—445).—The construction of flow-meters to deal with as little as 10 c.c. per

min. is discussed. Fixed-pressure instruments become very inaccurate with use. Proportionality between pressure difference and flow rate may be obtained in a fixed constriction instrument by using as the constriction a set of long parallel capillaries; a piece of "solid" bamboo cane is excellent for this purpose. By this means an instrument with an error not exceeding ± 5 c.c. per min. below 100 c.c. per min. should be attainable. W. J. G.

Mechanised gas analysis apparatus.—See A., 1938, I, 329.

Identification and determination of volatile alcohols and acids.—See A., 1938, II, 252.

Determination of pyruvic and α -ketoglutaric acids in urine. F. E. KRUSIUS (Suomen Kem., 1938, 11, B, 10).—Pyruvic acid is reduced to lactic acid with Zn and H₂SO₄ in presence of CuSO₄. After removal of Zn and carbohydrates lactic acid is determined by a standard method. α -Ketoglutaric acid is pptd. as the 2:4-dinitrophenylhydrazone, which is oxidised (acid KMnO₄) to succinic acid and determined as the Ag salt. M. H. M. A.

Determination of [urinary] ketones. F. LAUERSEN (Klin. Woch., 1937, 16, 1187—1190).—A method for distillation of acetone with subsequent transformation into dihydroxybenzylideneacetone for photometric determination is described. F. W. L.

Colour test for pentoses. H. TAUBER (Proc. Soc. Exp. Biol. Med., 1938, 38, 171).—The benzidine test is very much more sensitive to pentoses than to glycuronates and can be used to differentiate them in the urine. V. J. W.

Biochemical sugar determinations. I. F. T. VAN VOORST (Chem. Weekblad, 1938, 35, 338—341).—Solutions of sugars (sucrose, lactose, maltose) are analysed by Kruisheer's method using Luff's reagent, before and after fermentation with *Saccharomyces cerevisiae*, *Schizosaccharomyces Pombe*, and *Torula lactosa* and the results are applied to the interpretation of similar data obtained on starch syrups. On the whole, the results for glucose and maltose are satisfactory but *T. lactosa* does not give a completely non-reducing residue with sucrose. S. C.

Determination of pectic material. H. COLIN and S. LEMOYNE (Bull. Soc. Chim. biol., 1938, 20, 343—351).—The substance is boiled with 18% HCl and the CO₂ evolved is determined. In most of the pectins found in plants, two of the four carboxyl groups are esterified with methyl alcohol, which is determined by Zeisel's method. Theoretically the ratio, *R*, of esterified : total carboxyl group should be 0.5. Vals. of *R* are given for cotton, hemp, flax, jute, raffia, flour, gums, bran, fungi, algæ, and mosses. In most cases *R* is above 0.5, due generally to the presence of lignin. J. N. A.

Spectrophotometric determination of benzene in blood and organs. F. X. MAYER (Mikrochem., 1938, 24, 29—43).—The sample is mixed with alcohol and distilled in a current of alcohol vapour. Benzene in the distillate is determined by measuring its extinction coeff. using a rotating-sector photometer.

0.3 mg. of benzene in 50 c.c. of blood or in 100 g. of an organ can be determined with a mean error of 6%.

O. J. W.

Detection of pentamethylenetetrazole in urine and in blood. M. J. SCHULTE (Pharm. Weekblad, 1938, 75, 386—388).—5 c.c. of 20% Pb acetate solution are added to 50 c.c. of urine, the filtrate is saturated with $(\text{NH}_4)_2\text{SO}_4$ and extracted with 20, 10, and 10 c.c. of CHCl_3 . The serum from 20 c.c. of blood is diluted with 5 vols. of water, heated to 100° , and 30 g. of $(\text{NH}_4)_2\text{SO}_4$ are added with a few drops of HCl. The filtrate is extracted with CHCl_3 as above. In each case the extract is evaporated, the residue dissolved in a small amount of water and tested for pentamethylenetetrazole with CuCl . After administration, the drug could not be detected in the urine and, although tests in blood were positive 3 min. after effect, only traces of the drug were present after 1 hr.

S. C.

Method of separating α - and β -lecithin. T. YOSHINAGA (J. Biochem. Japan, 1938, 27, 1—5).—The lecithin prep. is dissolved in a min. amount of acetone and pptd. by alcoholic CdCl_2 . The ppt. is washed with alcohol followed by ether-alcohol mixture (7:3) and then treated with warm acetone, in which β -lecithin is sol. and α -lecithin insol.

F. O. H.

Mercuric selenite as catalyst in the Kjeldahl method for the determination of nitrogen. I. Application to the determination of nitrogen in protein, organs and faeces. II. Determination of total urinary and "rest" nitrogen. C. DUMAZERT and Y. MARCELET (Bull. Soc. Chim. biol., 1938, 20, 201—211, 212—216).—The use of HgSeO_3 as catalyst for the digestion leads to the same results as are obtained by the Dumas method.

A. L.

Determination of ammoniacal and protein nitrogen in presence of one another and of disturbing substances. C. HAESLER and H. FINK (Z. Spiritusind., 1938, 61, 121—122).—In studying protein synthesis by yeast in media containing NH_4 salts, low and uncertain results for inorg. N are obtained in presence of PO_4^{3-} by the MgO distillation method, but const. and approx. theoretical vals. are obtained with $(\text{NH}_4)_2\text{HPO}_4$ by vac. distillation with $\text{MgO}-\text{CaCl}_2$ (method described). Higher and concordant results are also obtained for inorg. N in sweet potato-mash, whilst vals. for $(\text{NH}_4)_2\text{HPO}_4$ added to such mashs are satisfactory.

I. A. P.

Gasometric micro-determination of blood-urea with hypobromite. C. O. GUILLAUMIN (Bull. Soc. Chim. biol., 1938, 20, 159—164).—The method employs 0.5 c.c. of serum, the determination being carried out in a vac. in the Van Slyke apparatus.

A. L.

Spectro-comparator for study of hæmoglobin. F. G. HALL (J. Elisha Mitchell Sci. Soc., 1935, 51, 289—292).—The spectroscopic technique is modified to permit determination of dissociation curves of hæmoglobin between the limits 20—80% saturation. Dil. solutions of hæmoglobin can be examined.

Ch. Abs. (p)

Determination of glutathione in tissues based on its reaction with sulphur to form hydrogen sulphide. J. D. GUTHRIE (Contr. Boyce Thompson Inst., 1938, 9, 223—232).—The method described

gives satisfactory recovery of added glutathione from tissues and from tissue extracts. Due to its specificity it gives lower results than the iodometric method, even when this is corr. for ascorbic acid. It is in good agreement with the Cd lactate method of Binet and Weller (A., 1934, 574) when applied to potato tissue.

AUTHOR.

Colorimetric determination of creatinine in urine and blood with 3:5-dinitrobenzoic acid. A. BOLLIGER (Med. J. Australia, 1936, 818—826).—A method, depending on the colour reaction with 3:5-dinitrobenzoic acid (A., 1936, 1397; Benedict and Behre, *ibid.*, 1013), will determine 0.2 mg. of creatinine in urine and spinal fluid. It is applicable only to blood filtrates exhibiting marked creatinine retention.

H. G. R.

Sources of error in the determination of tyrosine and tryptophan in complex materials, associated with hydrolysis. J. W. H. LUGG (Biochem. J., 1938, 32, 775—783).—Hydrolysis with alkali in the presence of air is recommended for the determination of tyrosine where di-iodotyrosine or cystine is present. In all other cases alkali stannite is preferred, since less tryptophan is destroyed and the final hydrolysates, especially from plant tissues, are less deeply coloured; protection is also afforded from oxidising impurities. Alkali-resistant glass vessels are most satisfactory, and hydrolysis is carried out (by 5N-NaOH or alkali stannite) at 100° for 20—30 hr. Di-iodotyrosine is quantitatively reduced to tyrosine by alkali stannite and tyrosine is liberated from O-glucoside linkages by alkali hydrolysis.

P. G. M.

Determination of arginine and histidine.—See A., 1938, II, 222.

Determination of bismuth in biological materials. S. L. TOMPSETT (Analyst, 1938, 63, 250—252).—Senzi and Seghezze's reaction (A., 1929, 1412) for Bi with thiourea in acid solution is made the basis of a quant. method. Within a range of 0.005—0.8 mg. of Bi in 5 ml. of 20% H_2SO_4 the yellow colour produced is proportional to the amount of Bi present, but not with more than 0.8 mg. A detailed procedure for the determination in urine is described.

E. C. S.

Spectroscopic determination of metals in cases of poisoning. J. VAN CALKER (Arch. Gewerbepath. Gewerbehyg., 1937, 7, 685—691).—Apparatus and method which give 15—20% accuracy are described.

M. A. B.

Determination of calcium soaps in faecal matter. L. BRULL and G. BARAC (Compt. rend. Soc. Biol., 1938, 127, 818—820).—The Ca soaps are extracted by CHCl_3 from faecal matter dried at 70° or 110° (but not from the fresh material) and are determined from the Ca content of the CHCl_3 extract.

H. G. R.

Determination of copper in tissues. Z. GRUZEWKA and G. ROUSSEL (Bull. Soc. Chim. biol., 1938, 20, 365—372).—The Cu is pptd. by benzoin-oxime (A., 1936, 536) and the ppt. separated and dried at 110° . The CHCl_3 "drop" method (*ibid.*) detects 3 p.p.m.

J. N. A.

Micro-determination of mercury.—See A., 1938, I, 324.