BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

A., III.—Physiology and Biochemistry (including Anatomy)

OCTOBER, 1939.

(i) GENERAL ANATOMY AND MORPHOLOGY.

Comparative morphology of the vertebral spinal column. Its form as related to function. H. ROCKWELL, F. G. EVANS, and H. C. PHEASANT (J. Morph., 1938, **63**, 87—117).—Since fish live in a buoyant medium the vertebral column is equally supported at all points. As it is not subjected to the complicated stresses occurring in land vertebrates it is simple in structure, shows little regional differentiation, and, besides protecting the spinal cord, serves mainly for the support and attachment of the lateral, locomotor muscles. The vertebræ are amphicoelous and held together by intervertebral ligaments and by the dorsal longitudinal ligament which runs the whole length of the column dorsal to the centra and within the neural arches. Only slight movement is possible between successive vertebræ. The myomeres are situated intervertebrally and their horizontally arranged fibres are inserted in the myocommata which are attached to the middle of the centra. This arrangement and the zig-zag form of the myomeres makes for increased efficiency in lateral bending movements. Zygapophyses are not present in the vertebræ except in the higher fish in which the vertebral column becomes a spring which straightens as soon as the bending force caused by the contraction of the muscles of one side is removed. In the tetrapods the vertebral column is supported only by the pectoral and pelvic limbs. The trunk vertebræ have to support most of the body-wt. so that they become subjected to tension and compression stresses. Zygapophyses develop in order to strengthen the column and intervertebral discs to protect the adjacent surfaces of the vertebræ. Regional differentiation appears and modifications of the planes of articulation restricting movements of particular regions of the spine. In the lower forms movement is lateral and the articular surfaces are oblique. In the mammals the lumbar region is elongated and the articular surfaces are nearly vertical, permitting flexion and extension in this plane. The metameric muscles of the fishes gradually give rise to long spinal flexors and extensors. The mammalian vertebral column is more comparable with a loaded double-overhang beam than with a cantilever bridge. Owing to the wt. of the head and neck the neural arches of the cervical vertebræ are subjected to tensile and the centra to compression stresses. Reversal occurs in the dorsal region, and in the lumbar region the centra are subject to tensile and the neural arches to compression stresses. This is reflected in the greater development of the centra in the cervical region and of the neural arches in the lumbar region. In bipedal animals such as man there is no such reversal. The centra are all subject to compression and the neural arches to tensile stresses. Hence the centra become progressively larger from the cervical to the lumbar region. Stability in man is also increased by the shortening of the lumbar region, by the greater obliquity of the articular surfaces of its vertebræ, and by the development of the lumbar curve. A. D. H.

Changes in composition of membrane bone following fracture of a long bone. M. MOURGUE (Compt. rend. Soc. Biol., 1939, **131**, 382—383).—Following fracture of the femur in adult rats there is a progressive demineralisation of the membrane bones of the skull, reaching a max. after 25 days. P. C. W.

Case of Morquio's disease. T. CRAWFORD (Arch. Dis. Childh., 1939, **14**, 70—77).—An isolated case in a boy of 9 is described. Walking began at 21 months and was followed by a series of fractures. Skiagrams show generalised osteoporosis, marked platyspondyly, and great irregularity of epiphyseal growth. There was an increase in the plasma-phosphatase, with normal serum-Ca and -P. The phosphatase and radiological appearances were uninfluenced by the administration of large doses of vitamin-*D*. C. J. C. B.

Congenital absence of bones of lower limb. J. A. BRUSSEL (J. Amer. Med. Assoc., 1939, **112**, 1050—1052).—A case report. R. L. N.

Histo-pathology of bones after feeding with fluoride. H. KELLNER (Arch. exp. Path. Pharm., 1939, **192**, 549—569).—A study of the changes in the skeleton of new-born dogs which received NaF in their diet. The changes described are somewhat reminiscent of rickets: abnormalities of calcification, periosteal proliferations, and disturbances of enchondral ossification. In addition, pptn. of cryst. Ca salts occurs. H. BL.

Changes in bone after administration of fluorine. T. SIMADA (Fukuoka Acta Med., 1939, **32**, 61—62).—NaF was given to adult rabbits and rats and young rats. No changes were observed in the joint cartilages. In adult rabbits the surface of the bone becomes white and sclerosed, with thickening and swelling of the diaphysis. *X*-Ray shows generally thickening of the bone, involving both compact and spongy areas. New bone formation is stimulated by NaF. In rats no gross or radiological changes could be produced; histologically the osteoclastic and osteoblastic activity resembled that seen in

rabbits. In young rats small doses, which did not affect the bones, caused "mottled teeth"; no rachitic changes were observed. W. D'A. M.

Study of normal and rachitic bone structure by microphotographic methods. L. SIEGEL, R. M. ALLEN, G. MCGUIRE and K. G. FALK (Amer. J. Path., 1939, **15**, 273—278).—Greater wealth of detail and better and sharper definition of all detail in the epiphyseal layers of normal, rachitic, or partly healed rachitic bones were obtained by photographs made by infra-red radiation as compared with normal or ultra-violet rays. The technique is described in detail. (13 photomicrographs.) C. J. C. B.

Structure of teeth in a late case of osteogenesis imperfecta. M. A. RUSHTON (J. Path. Bact., 1939, **48**, 591—603).—The teeth were small with pinkish crowns and short translucent roots. Odontoblasts had differentiated normally, though the growth of the whole dentinal papilla was reduced. Normal matrix and Tomes' fibrils were produced at the periphery of the teeth but soon the odontoblasts and other cells concerned ceased to form these. This change occurred first where the odontoblasts were oldest and in a piecemeal manner. Focal defects in the rate of formation of the matrix led to the inclusion therein of blood vessels. The peripheral pulp cells produced precollagenous argyrophil fibres but these were not converted into collagen except in the immediate proximity of blood vessels. Pulp stones of good collagen content occurred in the middle of the dentinal papilla. The matrix was inadequately calcified and probably lacking in cementing substance. At a later stage a tissue resembling primitive fibre bone replaced the former pulp cavity, and most of the dentinal tubules which had been formed became occluded. C. J. C. B.

Case of sternalis muscle. F. MOREAU (Ann. Anat. path. méd.-chir., 1939, **16**, 684—685).—From an attachment to both sternal heads of the sternomastoid, the front of the manubrium and upper part of the body of the sternum superiorly, three fleshy digitations extended downwards on to the 3rd, 4th, and 5th right costal cartilages. The nerve supply was derived from the 3rd, 4th, and 5th intercostal nerves. W. F. H.

Anomalous right subclavius muscle. RIGAUD (Ann. Anat. path. méd.-chir., 1939, **16**, 689—691).—The abnormality consisted of two well-marked fleshy fasciculi, apparently delaminations from the subclavius muscle, attached laterally to the medial border of the coracoid process and medially to the subclavius muscle near its attachment to the first costal cartilage. The lateral pectoral nerve passed between the two fasciculi. W. F. H.

(ii) DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Formal and experimental aspects of morphogenesis of vertebrate organism. D. HOLMDAHL (Roux' Arch., 1939, **139**, 191—226).—The cells of the tail-bud are indifferent cells which give rise to the caudal part of the organism (secondary type of development). The cranial part of the organism is derived from germ layers (primary type of development). Pasteel's (1937) view, which suggested that only quant. differences exist between these two mechanisms, is discussed. W. J.

Development of tunica dartos muscle and testes. R. V. PHILIPPS (Arch. Sci. biol., U.R.S.S., 1938, **44**, 51—59).—In rams at the age of 9 to 12 weeks (postpartum) the tunica dartos muscle develops a well-marked sensitivity to temp. changes. At about the same time the germinal epithelium starts to grow. The sensitivity to temp. changes fails to develop if the animals have been castrated before the 9th week; it disappears in animals castrated after the age of 12 weeks. Subcutaneous injections of testicular hormone "hombreol" stimulate the precocious development of the tunica dartos muscle of normal rams. T. T.

Development of gill pouches and nephridia of larval and metamorphosising *Amphioxus*. A. NAEF (Zool. Jb. (Anatomie), 1939, **65**, 469—516).—The juncture of ectoderm and endoderm in the gill pouches is not a direct one; cells of the "vestibulum" of the nephridia, filling the narrow space between the two layers, fuse with either of them and form the margin of the perforated gill pouch. All 17 larval gill pouches appear under the corresponding myoseptum. From this observation an original conformity of the branchiomeric and myomeric organisation of the chordates is deducted. The details of the development of the gill pouches and the changes they undergo during metamorphosis are described. W. J.

Early development of lung in amphibia, especially in *Hynobius nebulosus*. R. TAKASIMA, S. WAKE, and M. KOMISIIKE (Folia anat. japon., 1939, **17**, 575—591). W. J.

Seasonal changes in testis of musk turtle, *Sternotherus odoratus*, L. P. L. RISLEY (J. Morph., 1938, **63**, 301—317).—When the animals emerge from hibernation the testis is small and the epididymis is enlarged, being full of spermatozoa. Both testis and epididymis reach a min. size during the breeding season in May. Spermatogonial divisions begin in May. Primary spermatocytes and maturation divisions become numerous in early July. Spermatogenesis is at a max. during July and August when the size of the testis is also greatest. The spermatozoa pass into the epididymis and there is no spermatogenesis during the winter. There are no seasonal changes in the interstitial cells. A. D. H.

Action of colchicine on chicken embryos at different stages of development. S. LALLEMAND (Compt. rend., 1939, **208**, 1048—1049).—Chick embryos (11—40 hr.) treated with 1—2·5 μg. of colchicine give rise to a variety of abnormal forms except strophosomes; those 40—68 hr. old, injected with 2·5 μg., give rise to strophosomes or cœlosomes. Embryos older than 72 hr. are unaffected. J. L. D.

Choline-esterase activity of embryonic tissues. C. TORDA (Biochim. Terap. sperim., 1938, **25**, 532—539).—The choline-esterase activity of skeletal muscle,

spinal chord, and blood (rabbit, chicken) is higher before (and shortly after) birth than in adult animals. S. O.

Genetic hormonal factors in biological processes. C. H. DANFORTH (Bull. N. Y. Acad. Med., 1939, **15**, 359—367).

Heredity of coat colour in dogs. R. LIENHART (Compt. rend. Soc. Biol., 1939, **130**, 352—356).—By postulating genes responsible rather for the type of coloration (determining whether the hairs are all of the same colour and whether the body-hairs are the same colour as the horsehair) instead of determining the actual colour of the hairs, the chief difficulties in the interpretation of the inheritance of coat colours are overcome. P. C. W.

Genetics of the fowl. VII. Breed differences in susceptibility to extreme heat. F. B. HUTT (Poultry Sci., 1938, **17**, 453—462).—Among breeds examined, White Leghorns were the most resistant to high temp., probably because of their smaller body size. Susceptibility to heat increases with age, but is unrelated to the rate of, or capacity for, egg production. A. G. P.

Immunogenetic studies of species and of species hybrids in doves: separation of species-specific substances in the back-cross. M. R. IRWIN and L. J. COLE (J. Exp. Zool., 1936, **73**, 85—108).—A new constituent is isolated from cells of the hybrid, due to interaction of genes. The biochemical composition of the red cells is a quant. genetic character. CH. ABS. (*p*)

Lamarck as a biological theorist. S. TSCHULOK (Bio-morphosis, 1938, **1**, 173—201).—Lamarck is shown as an author of an immense speculative system based mainly on erroneous chemical theories. This resulted in the assertion that nature working along an "unchangeable plan" gradually perfected the simpler organisms and explained varieties of animals by the combined influence of a "directing" and a "disturbing" factor. W. F. H.

Further evidence for Lamarckian theory of cause of evolution. E. W. MACBRIDE (Nature, 1939, **143**, 205—206).—A review. W. F. F.

(iii) PHYSICAL ANTHROPOLOGY.

Blood, taste, digital hair, and colour of eyes in Eastern Eskimo. K. W. SEWALL (Amer. J. phys. Anthrop., 1939, **25**, 93—99).—Determinations of blood group frequencies in 146 pure and 56 mixed types from Labrador and Baffin Land revealed lower % of *O* and higher % of *A* than recorded in other Eskimo. No *B* was found and only two individuals of group *AB*. The *M*, *N* % did not differ significantly from European vals. 43% of males could taste phenylthiocarbamide. 1·3% showed hair on the second digital phalanx. No blue eyes were observed. W. F. H.

(iv) CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Histology and self-differentiating capacity of abnormal cartilage in a new lethal mutation in the rat (*Rattus norvegicus*). H. B. FELL and H. GRÜNEBERG (Proc. Roy. Soc., 1939, **B**, **127**, 257—277).—The two chief abnormalities characterising the cartilage of the lethal rat are the formation of thick capsules around the chondroblasts and very active proliferation and chondrogenesis in the perichondrium. The abnormality of lethal tissue does not progress during cultivation *in vitro*. Normal cartilage grafted into a lethal rat does not develop the abnormality, but abnormal tissue grafted into a normal rat grows vigorously and all the characteristic lethal abnormalities advance markedly. It is concluded that the characteristic abnormality is intrinsic in the tissue at least in post-embryonic life and does not depend on general physiological conditions peculiar to the lethal animal. F. B. P.

Golgi apparatus of ganglion cells in submaxillary gland of dog. T. ITO and S. AOKI (Folia anat. japon., 1939, **17**, 567—573).

Histological mechanism of regeneration of striated muscle in *Anura*. L. PRUTSCHER (Magyar Orv. Arch., 1939, **40**, 1—8). A. W. M.

Constancy of the number of cells in the labial glands of *Telmatoscopus meridionalis*. C. GUARESCHI (Boll. Soc. ital. Biol. sperim., 1939, **14**, 121—122).—The no. of cellular elements is 21—27 (greatest frequency at 24) and is independent of age or size of the gland. F. O. H.

Normal and malignant cells in culture. W. H. LEWIS (Arch. exp. Zellforsch., 1939, **23**, 8—26).—A detailed investigation of the cultural characteristics of normal fibroblasts and sarcoma cells. R. J. O'C.

Effect of vitamins on tissue cultures. H. VOLLMAR (Arch. exp. Zellforsch., 1939, **23**, 42—59).—By the addition of vitamins to normal cultures hypervitaminosis has been produced. For each vitamin the amount could be determined which did not affect the rate of growth of tissues. Smaller or larger amounts caused an increase or decrease of growth. Small amounts of *-A* cause increase of growth of normal and tumour tissues. Larger amounts decrease. *-B* stimulates normal tissues and depresses tumour tissues. *-C* stimulates normal tissues and has no effect on tumours. *-D* has no effect on either. *-E* inhibits cultures of tumours and stimulates those of normal tissues. R. J. O'C.

Influence of the medium on explanted tumour tissue. H. JACHIMSKY (Arch. exp. Zellforsch., 1939, **23**, 68—75).—Using various types of culture media, it was found that the behaviour of a spontaneous tumour and one caused by benzpyrene was different. These tumours were histologically identical and no explanation can be given for the different behaviour. R. J. O'C.

Growth and metabolism of tissue cultures in radium-containing media. H. VOLLMAR and K. INOUYE (Arch. exp. Zellforsch., 1939, **23**, 27—41).—Ra in tissue culture media affects both metabolism and growth. Chicken heart cultures showed an increase of metabolism with small doses and a decrease with large. There was no effect on sarcoma cultures. Prolonged exposure to Ra diminished both the

growth and metabolism in cultures of normal and tumour tissues. R. J. O'C.

Neurohistological technique. O. A. TURNER (J. Lab. clin. Med., 1939, **24**, 991—1003).—The technique for some connective tissue stains, and stains for pituitary and pineal glands and for spirochætes in nervous tissue, are described. C. J. C. B.

Triple stain for amphibian embryos. D. W. SLATER and E. J. DORNFELD (Stain. Tech., 1939, **14**, 103—104).—Fixation in Bouin-dioxan (2 : 1) is followed by paraffin embedding through dioxan. After staining in Harris' hæmatoxylin and blueing in tap-water, sections are stained in 1% safranine in aniline water for 5 min., washed in water, and counterstained for 1—2 min. in 0·5% fast-green in 95% alcohol. After washing and dehydration in abs. alcohol, sections are cleared and mounted in balsam. Yolk granules and nuclei are red, ground cytoplasm green, resting nuclei blue, mitotic chromosomes purple, spindle fibres green. E. E. H.

Dioxan dehydration for paraffin-embedded fucus slides. A. O. SIMONDS (Stain. Tech., 1939, **14**, 101—102).—Excellent paraffin preps. can be made using the slow dioxan method and staining with fast-green in acetone and safranine. E. E. H.

Fixation of reagents by tissues. H. HERRMANN (Skand. Arch. Physiol., 1939, **82**, 96—104).—Chorionic tissue from chick eggs takes up P from a 0·1N. solution of HPO_3 in amounts which equal 19—20% of the chorionic N content. Dead chorionic membranes (killed by heat) take up less naphthol-black as the p_H of the solution rises; the relationship is reversed with neutral-red. Fixation of dyes in living membranes does not vary with the p_H of the solutions. A. S.

Improvements in permanent root tip squash technique. B. B. HILLARY (Stain Tech., 1939, **14**, 97—99).—Maize syrup for mounting should be diluted with water, not with acetic acid as previously recommended, as the latter causes fading of stain. If the dioxan–balsam method is used, treatment with aq. NH_3 before applying the Feulgen technique greatly helps the subsequent separation of cells, and improves the staining. E. E. H.

Lipins of cell nuclei. C. A. STONEBURG (J. Biol. Chem., 1939, **129**, 189—196).—Cell nuclei are separated from tissue by immersing the whole in 5% citric acid, centrifuging, and removing the remaining muscle debris by peptic digestion. The acetone-sol. and -insol. lipin fractions and cholesterol are determined for nuclei from ox heart muscle, rabbit thigh muscle, tumour cells, and pus cells. The amounts are similar to, but higher than, those of the respective whole tissues. The phospholipin : cholesterol ratio is unusually low. R. S. C.

Thermal and lighting conditions for cinematography of formation of first polar body in mouse. B. TSARTSARIS (Compt. rend. Soc. Biol., 1939, **131**, 205—208). P. C. W.

(v) BLOOD AND LYMPH.

Apparatus for taking blood from guinea-pigs. G. SCHOOP (Zentr. Bakt. Par., I, 1939, **143**, 271—272).—A conical centrifuge tube is used with a hole near the rim. The tube is placed over the ear from which a small edge has been cut and suction is applied by a pump which is connected with the hole by a pierced rubber cork. G. W.

Normal hæmatological standards in aged. I. MILLER (J. Lab. clin. Med., 1939, **24**, 1172—1176).—In 160 men between the ages of 60 and 104 the average red cell count was 4,600,000 per cu. mm. with 14·3 g. of hæmoglobin per 100 c.c. of blood. The white cell count and differential count were within normal adult limits. C. J. C. B.

Bone marrow function. L. COTTI (Folia Hæmat., Lpz., 1939, **61**, 369—385).—A review. A. S.

Effect of sternal puncture on blood formation. R. STODTMEISTER and P. BÜCHMANN (Folia Hæmat., Lpz., 1939, **61**, 312—316).—Repeated sternal punctures do not influence blood or bone marrow count. A. S.

Cytologic study of marrow in flat bones of man. J. STASNEY and G. M. HIGGINS (Folia Hæmat., Lpz., 1939, **61**, 334—344).—Bone marrow specimens taken from the right 7th rib, the middle of the sternum, and the body of the 3rd lumbar vertebra of 14 subjects after accidental death had identical structure. The no. of mycloid cells was greater than that of the erythroid cells. A. S.

Effect of cobalt salts on anæmia in the dog. M. POLONOVSKI and S. BRISKAS (Compt. rend. Soc. Biol., 1939, **130**, 1590—1593).—The rise in cell count, fall in alkali reserve, and raised blood-sugar in the dog following the administration of Co salts are probably due to concn. of the blood due to the toxicity of the Co. P. C. W.

Hæmopoietic action of cobalt in deficiency anæmia in rat. M. POLONOVSKI and S. BRISKAS (Compt. rend. Soc. Biol., 1939, **130**, 1588—1590).—Addition of Co to a diet producing anæmia in the rat raises the cell count and hæmoglobin content of the blood. This action is, however, probably secondary to the dehydration produced by the diarrhœa and wt. loss that results from the treatment. P. C. W.

White cell count after tonsillectomy. G. PELLICCIA (Arch. ital. Otol., 1939, **51**, 84—94).—The neutrophils were increased and the lymphocytes were decreased in 15 patients after tonsillectomy. The main changes were found 5—7 hr. after the operation; normal counts were obtained after 24 hr. C. E.

Effect of nucleic acid on blood formation. A. DUDITS and G. POPJÁK (Z. ges. exp. Med., 1939, **105**, 106—122).—Thymo- or yeast-nucleic acid was intravenously injected into rabbits in doses up to 2 g. per day. A single injection produces leucocytosis with shift to the left of the differential count and increase in reticulocyte count. The no. of leucocytes, red cells, and thrombocytes progressively decreases after prolonged treatment with nucleic acid. Myeloid

hyperplasia, karyorrhexis, and necrotic changes were observed in bone marrow; the spleen showed hæmosiderosis. Blood-alkali reserve is decreased, inorg. P and blood-sugar are augmented. A. S.

White cell count in parabiotic animals. A. G. BEER (Z. ges. exp. Med., 1939, **105**, 53—82).—Rabbits were made parabiotic by joining up their abdominal cavities by means of sutures in the abdominal walls. The exchange of blood through vascularisation of the tissue bridge is insignificant. Humoral exchanges take place through the abdominal cavity. Injection of air into a cerebral ventricle produces leucocytosis in one partner, followed shortly by leucocytosis in the second animal. It is thought that a humoral factor controls the white cell count. A. S.

Hodgkin's disease. (A) P. UHLENHUTH and K. WURM. (B) G. LIEBEGOTT. (C) R. GAUPP, jun. (Z. ges. exp. Med., 1939, **105**, 205—240, 241—254, 255—265).—The strength of a positive Gordon test in Hodgkin's disease depends on the no. of eosinophils in the inoculated material. The pathological changes correspond with a meningoencophalitis; there is marked involvement of the cerebellar cortex. The same histological changes can be produced by intracisternal injection of pus, bone marrow suspensions, or extracts of cancerous glands. The Gordon test is non-sp. and does not prove the virus ætiology of Hodgkin's disease. A. S.

Sedimentation rate of basophil leucocytes and myelocytes. A. G. H. LINDGREN (Folia Hæmat., Lpz., 1939, **61**, 317—318).—Basophil leucocytes and myelocytes have a slow sedimentation rate. A. S.

Iodophilia of leucocytes. F. HOFF and L. BACHMANN (Klin. Woch., 1939, **18**, 981—984).—Leucocytosis with iodophil leucocytes (mainly polymorphs) up to over 40% occurred in man or rabbits after injection of pyrifer; the degree of iodophilia was proportional to the amount of pyrifer injected. A similar iodophilia occurred in diabetic coma. Ventriculography in rabbits produced a leucocytosis without iodophilia. E. M. J.

Protein content of blood of chickens inoculated with leukæmia or sarcoma. S. MARCHAL, L. PATUREL, M. GUÉRIN, and P. GUÉRIN (Compt. rend. Soc. Biol., 1939, **131**, 213—216).—The protein content is diminished, particularly in those birds inoculated with sarcomata. There are large variations in different individuals and in the same individual at different times. P. C. W.

Protein content of blood of fowls immunised against chicken leukæmia. S. MARCHAL, L. PATUREL, M. GUÉRIN, and P. GUÉRIN (Compt. rend. Soc. Biol., 1939, **131**, 216—218).—A batch of chickens were inoculated with transmissible leukæmia. Those that had previously been immunised had a raised protein content in the blood, those not immunised had normal vals. The degree of augmentation was not related to the degree of immunity. P. C. W.

Pregnancy and leukæmia. W. T. SCHOPP (Folia Hæmat., Lpz., 1939, **61**, 319—333).—Report of a case. A. S.

Serum-phosphatase in leukæmia. D. ALBERS (Z. ges. exp. Med., 1939, **105**, 155—160).—8—17 units of serum-phosphatase (expressed in mg. P_2O_5 per 100 c.c.: method of Jenner and Kay) were found in cases of lymphatic or myeloid leukæmia. Phosphatase is increased in leukæmic serum after *X*-ray therapy. A. S.

Granulocytopenia following surgical sepsis treated with adenine sulphate. E. L. RICHMOND (New England J. Med., 1939, **221**, 267—269).—Report of a successful case. A. M. G.

Analysis of treatment and mortality of 390 cases of acute agranulocytic angina. H. JACKSON, jun., and T. J. G. TIGHE (New England J. Med., 1939, **220**, 729—733).—The mortality in 75 untreated cases was 78%; in 45 hospitalised cases receiving no sp. therapy 70%; in 130 cases receiving inadequate sp. therapy 77%; in 26 cases receiving liver extract 62%; in 85 cases given pentnucleotide 35%. Neither transfusions nor *X*-ray therapy affected the mortality rate. Yellow bone-marrow extract, leucocytic cream, and adenine sulphate merit further trial. A. M. G.

Detection of blood by means of chemiluminescence. F. PROESCHER and A. M. MOODY (J. Lab. clin. Med., 1939, **24**, 1183—1189).—3-Aminophthalhydrazide (luminol) is an extremely sensitive reagent for hæmatin and gives a brilliant luminescence in the dark which can be photographed. Inorg. catalysts can easily be identified by chemical tests. C. J. C. B.

Stability of combination of hæm and globin and denaturation of hæmoglobin. J. ROCHE and L. DONNAT (Compt. rend. Soc. Biol., 1939, **131**, 401—404).—Ox hæmoglobin is more stable to bases than horse hæmoglobin. Preservation in the erythrocytes at 0°, change into methæmoglobin, or reduction by Stokes–Hill reagent does not alter the stability of hæmoglobin. The stability is diminished by hæmolysis or reduction with $Na_2S_2O_4$. Following denaturation by treatment with Na salicylate the process can be reversed, producing a pigment having the same spectrum and O_2 affinity as the original hæmoglobin but differing in stability. The hæmoglobin produced artificially from hæm and globin is less stable than the naturally occurring hæmoglobin. P. C. W.

Hæmoglobin-oxygen equilibrium. A. M. ALTSCHUL and T. R. HOGNESS (J. Biol. Chem., 1939, **129**, 315—331).—From the effect of p_H and temp. on the O_2 uptake of salt-free horse hæmoglobin, it is deduced that neither variant changes the oxygenation interaction between the hæm groups, and that two acid groups on each hæm are probably affected by oxygenation. ΔH for the reaction between O_2 and hæmoglobin is $-15{,}500$ g.-cal. per mol. of O_2; ΔF° for the reaction between the first mol. of O_2 and the hæmoglobin mol. is -3000 g.-cal. per mol. Salt addition decreases the vals. of the equilibrium consts. and increases the interaction between hæm groups. E. M. W.

Disappearance of methæmoglobin in presence of alcohol. F. JUNG (Arch. exp. Path. Pharm., 1939, **192**, 464—471).—Alcohol increases the

methæmoglobin content of blood after poisoning with aniline and similar substances. This effect cannot be due to an effect of alcohol on the reduction of methæmoglobin, as alcohol has no effect on the disappearance of injected methæmoglobin in cats. Methæmoglobin disappears by being reduced within the circulation, not by being removed from the blood stream. H. BL.

Determination of red cell fragility [use of resistometer]. W. E. KÜNSTLER (Z. ges. exp. Med., 1939, **105**, 192—204).—Modifications of a resistometer are described; the apparatus can be used to determine red cell fragility and rate of hæmolysis and as a nephelometer. A. S.

Effect of radius of centrifuge on the centrifugation of blood. J. ETTORI and R. GRANGAUD (Compt. rend. Soc. Biol., 1939, **131**, 341—342).—The time required to attain a const. vol. of cells when centrifuging blood is not proportional to the radius of the centrifuge used. P. C. W.

Present status of blood sedimentation rate. A. S. JOHNSON (New England J. Med., 1939, **220**, 823—827).—A review. A. M. G.

Osmotic pressure of gum acacia solutions. G. SASLOW (Proc. Soc. Exp. Biol. Med., 1939, **40**, 277—281).—By the method of Dodds and Haines the osmotic pressure of 6% acacia in 0·9% NaCl was determined to be 246—260 mm. water, or about the same as the colloid osmotic pressure of human serum. V. J. W.

Variations in plasma-potassium produced by hæmorrhage and blood transfusion. J. L. MOGLIA (Rev. Soc. argent. Biol., 1939, **15**, 82—86).—Chloralosed dogs showed an increase of up to 20 mg.-% in plasma-K when blood was withdrawn in amounts equiv. to 2·5% of the body-wt. The increase was rapid and coincided with the fall in blood pressure. Loss of smaller quantities of blood produced inconst. results. Acute double adrenalectomy increased sensitivity to hæmorrhage; the drop in blood pressure and increase in K occurred when the blood lost was less than 2·5% of the body-wt. Transfusion restored the blood pressure and K concn. in 3 out of 4 experiments. J. T. L.

Blood volume in ergotamine tartrate poisoning in rats. J. Q. GRIFFITH, jun., B. I. COMROE, and C. J. ZINN (Proc. Soc. Exp. Biol. Med., 1939, **40**, 177—179).—Ergotamine causes general vascular spasm with diminished blood volume. Lumbar sympathectomy raises blood vol. but increases the incidence of gangrene of the tail. V. J. W.

Transfusion syphilis. F. RONCHESE (New England J. Med., 1939, **220**, 556—557).—Report of a case. A. M. G.

Profibrin. IV. Agglutination of thrombocytes by profibrin. K. APITZ (Z. ges. exp. Med., 1939, **105**, 89—94).—Profibrin agglutinates thrombocytes suspended in oxalate serum; this precedes the pptn. of fibrin and is due to an amorphous coagulation at the surface of the thrombocytes. A. S.

Deficiency of prothrombin associated with various intestinal disorders; treatment with anti-hæmorrhagic vitamin-*K*. R. L. CLARK, jun., C. F. DIXON, H. R. BUTT, and A. M. SNELL (Proc. Staff Mayo Clin., 1939, **14**, 407—416).—A report of 8 cases, showing that the concn. of prothrombin in the circulating blood should be determined if bleeding occurs in any case with inadequate food intake, subnormal assimilation, diminution of the intestinal absorptive surface, or chronic diarrhœa. Low prothrombin levels can be corr. by oral administration of bile salts and vitamin-*K*, or -*K* alone intramuscularly. A. M. G.

Prothrombin conversion rate in various species. E. D. WARNER, K. M. BRINKHOUS, and H. P. SMITH (Proc. Soc. Exp. Biol. Med., 1939, **40**, 197—200).—By adding oxalate to a clotting mixture after varying intervals it is possible to construct a curve of thrombin formation. This formation takes 2—3 times as long in human and guinea-pig blood as in a large no. of other vertebrates. V. J. W.

Calcium factor in quantitative determination of prothrombin. A. J. QUICK (Proc. Soc. Exp. Biol. Med., 1939, **40**, 206—208).—Comparable clotting time results can be obtained only if the added $CaCl_2$ is const. and not varied to give a min. time as recommended by Stewart and Pohle (A., 1939, III, 354). V. J. W.

Effect of lecithin on thrombokinase of daboia venom and of brain extracts. J. B. LEATHES and J. MELLANBY (J. Physiol., 1939, **96**, 39P).—Lecithin augments the hæmostatic activity of daboia venom (confirming Trevan and Macfarlane) and in a smaller degree that of kinase pptd. from brain extracts at p_H 5·5. J. A. C.

Thrombokinase from brain. J. B. LEATHES and J. MELLANBY (J. Physiol., 1939, **96**, 38P).—The activity of the p_H 5·5 ppt. from brain extract is of the same order as that of the thrombokinase from daboia venom; the prothrombase requires about 1% of its wt. of the brain-kinase powder to produce a thrombase of similar efficiency to that produced by the dry venom (0·005 mg. acting on 1 mg. of prothrombase). J. A. C.

Coagulation of serum of healthy and tumour-bearing animals and men. B. PURJESZ (Ung. med. Arch., 1936, **37**, 221—230; Chem. Zentr., 1937, i, 1705).—Serum from subjects with tumours (rats infected with Jensen sarcoma, and men) has a longer coagulation time at 70° than serum from normal subjects, the difference increasing with the wt. of the tumour. Considerable differences also occur at 68°, and particularly at 65°, between sera from cancer cases and healthy subjects. The coagulation time increases on keeping the serum (particularly with cancer cases) and is reduced by treatment with CO_2. The albumin : globulin ratio is abnormally small in cancer. Serum from patients treated with Ra or *X*-rays is nearly normal. A. J. E. W.

Determination of blood coagulation time. H. DYCKERHOFF, N. GOOSSENS, and J. SCHWANTKE (Z. ges. exp. Med., 1939, **105**, 145—148).—The coagulation time of oxalate plasma after addition of a $CaCl_2$ solution is 2—4 min. in normal subjects. A. S.

Blood changes in hæmophilia. E. HEYL (Klin. Woch., 1939, **18**, 960—963).—The blood of 52 members of a family of bleeders was examined; thrombocyte count was higher and coagulation time longer than normal in many of the clinically healthy but actual or potential transmitters. E. M. J.

Unusual case of [red cell] autoagglutination. K. M. WHEELER, H. J. GALLAGHER, and C. A. STUART (J. Lab. clin. Med., 1939, **24**, 1135—1138).—The cold agglutinations in the patient described reached a titre of 1/10,240. No other members of the family were affected. C. J. C. B.

Blood dyscrasias, with special reference to splenectomy. J. H. J. UPHAM (New England J. Med., 1939, **220**, 691—696).—A review. A. M. G.

Fluorescence photometry of human serum. R. KESSLER and W. TISCHENDORF (Arch. exp. Path. Pharm., 1939, **192**, 590—599).—A discussion of the clinical applications of the method; the normal variations are too wide to permit diagnostic conclusions. H. BL.

Rotatory dispersion of horse serum. A. BOUTARIC and M. ROY (Compt. rend. Soc. Biol., 1939, **130**, 862—863).—The average val. for the rotatory dispersion between the yellow and green Hg lines is 1·083. H. G. R.

Variations in inorganic phosphorus content during adaptation of organism to [harmful] agents. G. MASSON and H. SELYE (Compt. rend. Soc. Biol., 1939, **130**, 1442—1443).—During treatment with noxious agents (cold, exercise, injection of formalin) the inorg. P of the blood first increases, then decreases, and finally increases. H. G. R.

Serum-iron and influenza. P. BÜCHMANN and E. HEYL (Klin. Woch., 1939, **18**, 990—992).—Serum-Fe vals. of 20 μg.-% and less were observed in 7 cases of influenza; normal vals. were attained during convalescence. E. M. J.

Activation and inhibition of phosphatase system of blood cells. J. ROCHE and E. BULLINGER (Compt. rend. Soc. Biol., 1939, **131**, 398—401).—The blood cells of the horse contain two forms of phosphatase. One form hydrolyses Na α-glycerophosphate more readily than the β-form, has an optimal action at p_H 6, and is insensitive to activation by Mg and to inhibition by F and alkali oxalates. The other form hydrolyses Na β-glycerophosphate more readily, has an optimal p_H of 9, and is activated by Mg and inhibited by F or alkali oxalates. The identity of the two phosphatases is discussed. P. C. W.

Determination of serum-phosphatase and its clinical significance. J. M. LOONEY (New England J. Med., 1939, **220**, 623—626).—Determination of serum-phosphatase is of diagnostic and prognostic val. in rickets, Paget's disease, and osteitis fibrosa cystica. It should be used more widely in the study of jaundice. A. M. G.

Chicken blood [in disease]. S. R. SHIMER (New Hampshire Agric. Exp. Sta. Tech. Bull., 1937, No. 69, 16 pp.).—In chicken suffering from paralysis, cannabalism, or after-effects of tremors the blood-non-protein-N, -urea, -uric acid, -total and preformed creatinine, -inorg. P, -$Ca^{\cdot\cdot}$, -Cl′, -glucose, and -p_H were normal. No consistent differences in non-protein-N, uric acid, or glucose were apparent in blood from different breeds, or when the level of protein feeding was changed from 16 to 26%. A. G. P.

Determination of cocarboxylase (vitamin-B_1 diphosphate) in blood. R. S. GOODHART and H. M. SINCLAIR (Biochem. J., 1939, **33**, 1099—1108; cf. A., 1939, III, 720).—A modified Ochoa–Peters method (A., 1938, III, 926) is described. Blood-cocarboxylase (average val. in 26 normal, adult males 7·0 μg. per 100 ml.), which appears to be present totally in a combined form, occurs in the blood cells; the polymorphonuclear leucocytes contain more than the lymphocytes and the non-nucleated erythrocytes least. Nucleated blood cells phosphorylate vitamin-B_1, a function apparently common to all nucleated animal cells. -B_1 exists in the blood in a freely diffusible form and also in combination with a serum-protein; it is transported to the tissues as free -B_1 or its monophosphate and not as cocarboxylase. F. O. H.

Action of intravenous hypertonic saline on serum-albumins and -globulins and on blood and serum viscosity in normal subjects and in patients with heart failure. G. RUSSO (Z. ges. exp. Med., 1939, **105**, 149—154).—Intravenous injection of 20 c.c. of a 10% NaCl solution reduces blood coagulation time, plasma-protein concn., and blood and serum viscosity; serum-NaCl is increased. These changes are more marked in patients with cardiac failure; serum-globulin is relatively more augmented than -albumin. A. S.

Krogh's precision syringe for rapid specific gravity measurement of serum as an indicator of protein content. J. SCHOUSBOE (J. Biol. Chem., 1939, **129**, 371—375).—The sp. gr. of serum is determined by weighing a definite vol. delivered from Krogh's syringe. E. M. W.

Electrophoretic analysis of normal human serum. R. A. KEKWICK (Biochem. J., 1939, **33**, 1122—1129).—Electrophoretic analysis of serum gives mean vals. of 59% of albumin and 41% of total globulins. The latter consists of 4·5 of α-, 11·0 of β-, and 25·5% of γ-globulin. The significance of the discrepancy between these results and those obtained by ultracentrifugal analysis (78% for albumin and 22% for total globulin) is discussed. P. G. M.

Seasonal variations of blood- and tissue-glutathione in rabbit. S. GAJATTO (Arch. Farm. sperim., 1939, **67**, 232—242).—In summer the reduced glutathione decreases in blood and increases in tissues (mainly muscle and liver). S. O.

Determination of blood-urea by the xanthhydrol method in presence of malonylurea derivatives. R. VIEILLEFOSSE and P. FEYEL (Bull. Soc. Chim. biol., 1939, **21**, 836—841).—The method is unaffected by the presence of less than 0·4% of barbituric acid derivatives. It may therefore be used in barbiturate anæsthesia, since the concn. of the drug in blood is approx. 0·005%. P. G. M.

Colorimetric determination of blood-cholesterol. B. Braier and A. Chouela (Rev. Soc. argent. Biol., 1939, **15**, 45—50).—Blood, plasma, or serum was extracted with acetone, heating at 70—75° for 5 min., or at room temp. for several hr. Fats and fatty acids were extracted simultaneously with cholesterol, but not phospholipins which interfere in the Liebermann–Burchard reaction. The acetone extract was evaporated at room temp. or by heating, the residue dissolved in $CHCl_3$, and the Liebermann–Burchard reaction performed; the max. colour developed in 5—8 min. Results obtained were similar to those given by the Myers–Wardell and Bloor–Muñoz methods and higher than those given by Grigaut's. Known quantities of cholesterol added to the blood were accurately determined. The advantages of the method are its rapidity (40 min.) and the accurate and easy colorimetric reading because the colorations given by phospholipins are eliminated. J. T. L.

Determination of blood-cholesterol. B. Braier and A. Chouela (Rev. Med. Cienc. Afin., 1939, **1**, 67—71).—A method, based on the Liebermann–Burchard reaction, is described. F. R. G.

Acid–base balance and distribution of fat in the blood. R. Levine and S. Soskin (Proc. Soc. Exp. Biol. Med., 1939, **40**, 305—308).—Administration of $NaHCO_3$ to dogs causes in 2 hr. a fall of 50% in serum-fat, while NH_4Cl causes a corresponding rise. The fat of the whole blood remains const. in both cases. Changes in serum-fat are inversely proportional to CO_2-combining power. V. J. W.

Influence of gestation, lactation, and age on composition of bovine blood. W. L. Kennedy, A. K. Anderson, S. I. Bechdel, and J. R. Shigley (J. Dairy Sci., 1939, **22**, 251—260).—Analysis of non-protein-N, glucose, Ca, and P of heifers from breeding to the end of one lactation showed no influence due to gestation or lactation. Glucose fell from 125 mg.-% at birth to 54 mg.-% at the end of a year. It increased markedly after giving milk to the calf. Giving glucose resulted in a marked increase in blood-sugar in young calves but had little effect in older animals. J. G. D.

Composition of blood of dairy goat. O. B. Houchin, W. R. Graham, jun., V. E. Peterson, and C. W. Turner (J. Dairy Sci., 1939, **22**, 241—250).—Analytical data for arterial and venous blood from lactating and non-lactating goats are given. Comparison with corresponding data for other animals showed that the plasma is not significantly different but that the cell vol. of the blood is much lower, due to the small size of the red blood corpuscles. J. G. D.

Nature and rôle of combined carbohydrates of hæmolymph of *Cancer pagurus*. C. Dumazert (Compt. rend. Soc. Biol., 1939, **130**, 1123—1126).—The hæmolymph contains fermentable carbohydrate which can be liberated by acetic acid and a second fraction containing glucosamine liberated only after hydrolysis by H_2SO_4. H. G. R.

Free chlorine as source of error in blood-sugar determinations. A. K. Anderson and L. Zipkin (J. Lab. clin. Med., 1939, **24**, 1209). C. J. C. B.

Changes in blood-sugar during fever. I. Ohtake (Jap. J. exp. Med., 1939, **17**, 249—267).—In rabbits during fever due to radiothermia there is no change in the blood-sugar level until the rectal temp. reaches 42°, when hyperglycæmia occurs and thereafter runs parallel with the temp. Starvation can increase the fever hyperglycæmia and retard the recovery. Hyperglycæmia caused by glucose loading is increased by irradiation while insulin hypoglycæmia is counteracted by hyperthermia and vice versa. Injections of typhoid and dysentery vaccine causes an initial hyperglycæmia followed by hypoglycæmia. In human febrile diseases the blood-sugar may also rise parallel with the severity of the disease but not parallel with the level of temp. Certain age differences are found in some fevers such as dysentery and scarlet fever, where there is a hypoglycæmia in adults and a hyperglycæmia in children. C. J. C. B.

Determination of protein-sugar and its constituents [in plasma]. H. Bierry, B. Gouzon, and C. Magnan (Compt. rend. Soc. Biol., 1939, **130**, 1454—1456).—Methods for determination of protein-sugar and glucosamine in the isolated proteins and plasma are described. In horse plasma the ratio of mannose + galactose to glucosamine is const. at 2 : 1. H. G. R.

Blood-proteins and determination of protein-sugar. H. Bierry, B. Gouzon, and C. Magnan (Compt. rend. Soc. Biol., 1939, **130**, 856—859).—Horse plasma contains 7·5—8·3% and 0·18—0·26% of protein and protein-sugar (expressed as anhyd. galactose), respectively, the sugar content of the protein being 2·4—3·2%. H. G. R.

Effect of powdered pancreas, pancreatic juice, and pepsin on alexin content of serum. F. Maignon and J. P. Thiéry (Compt. rend. Soc. Biol., 1939, **131**, 246—249).—Active trypsin, obtained by macerating powdered pancreas, when injected into the blood *in vivo* or added to fresh serum *in vitro* diminishes the alexin content and subsequently raises it above the normal level. Trypsinogen, obtained from dog pancreatic juice, has only the augmenting effect. Pepsin is without action. P. C. W.

Alexic power of powdered pancreas mixed with euglobulin, pseudoglobulin, and serum-albumin. F. Maignon and J. P. Thiéry (Compt. rend. Soc. Biol., 1939, **131**, 249—251).—The alexic power of powdered pancreas is increased when mixed with euglobulin, unaffected by pseudoglobulin, and diminished with serum-albumin. Alexin may be a complex of trypsin and a serum-euglobulin. P. C. W.

Effect of oleic acid on activity of hæmolytic system. H. Goldie (Compt. rend. Soc. Biol., 1939, **131**, 192—196).—Hæmolysis is obtained with lower amounts of human or horse alexin combined with heated hæmolytic anti-sheep serum in the presence of oleic acid. Oleic acid also increases the natural hæmolytic power of fresh human serum. The effect

is probably due to the elimination of anti-alexic substances. P. C. W.

(vi) VASCULAR SYSTEM.

Electric pulse counter. L. E. MOREHOUSE and W. W. TUTTLE (J. Lab. clin. Med., 1939, **24**, 1213—1216).—An automatic pulse counter which is accurate, stable, and simple to operate even during exercise is described. The pulse rate is read directly from the counter. C. J. C. B.

Rhythmicity and automatism in mammalian left auricle. C. J. ROTHBERGER and A. SACHS. (Quart. J. Exp. Physiol., 1939, **29**, 69—81).—Of 65 preps. of isolated muscular strips from the outer wall of the left auricle, suspended in Soejima's solution, 7 beat spontaneously. Not one of 15 preps. examined, including those that beat spontaneously, contained sp. nodal tissue. The strips responded to single condenser discharges or continued faradic stimulation, by rhythmic contraction outlasting the stimulation. Adrenaline sometimes produced rhythmic contractions and previous treatment with adrenaline facilitated the establishment of rhythm following faradic stimulation. In large doses histamine produced rhythm but small doses produced a refractory state not responding to subsequent large doses. $Ba^{\cdot\cdot}$ produced rhythm and subthreshold doses enhanced the effect of electrical stimulation. $Ca^{\cdot\cdot}$ inhibited spontaneous rhythm and also the action of histamine but increased the amplitude of the contractions caused by electrical stimulation. Strophanthin did not produce rhythm. Veratrine and aconitine produced rhythmic contractions of high frequency. T. S. G. J.

Short-wave irradiation of isolated heart. J. BLOMMERS (Arch. int. Pharmacodyn., 1939, **62**, 231—233).—The isolated rabbit heart, normal or poisoned by histamine, strophanthin, or P, exhibits increased force of contraction under short-wave irradiation. D. T. B.

Strophanthin and cholinergic mechanism of the heart. J. KULL (Arch. exp. Path. Pharm., 1939, **192**, 447—456).—Strophanthin increases the acetylcholine content of the frog's heart, but not of the cat's heart. Strophanthin does not inhibit choline-esterase. H. BL.

Effect of acetylcholine on electrocardiogram of the dog. P. H. NOTH, H. E. ESSEX, and A. R. BARNES (Proc. Staff Mayo Clin., 1939, **14**, 348—352). The e.c.g. changes are: (1) decrease in height, notching and diphasic character of the *P* wave; (2) partial and complete heart block; (3) ventricular standstill; (4) auricular fibrillation and auricular tachycardia. These findings explain the mechanism whereby cases of paroxysmal tachycardia of auriculo-ventricular, nodal, or auricular origin are benefited by the administration of choline derivatives. A. M. G.

Normal duration of *Q–T* interval. R. ASHMAN (Proc. Soc. Exp. Biol. Med., 1939, **40**, 150).—From about 1000 cases it was found that the *Q–T* interval is equal to $K \log [10(C + k)]$ where C is the cycle length in sec. and K and k are consts. at equal ages. V. J. W.

Electrocardiogram following auricular-ventricular block produced by crushing bundle of His. F. JOURDAN and R. FROMENT (Compt. rend. Soc. Biol., 1939, **131**, 286—288).—There are 4 phases: (i) a period of tachycardia usually of ventricular origin followed (ii) by a phase of ventricular paralysis, (iii) autonomic ventricular rhythm develops generally accelerating to reach (iv) a steady frequency. P. C. W.

Electrocardiographic alternation of frog's ventricles after poisoning with erythrophloein. L. M. VAN DEN BERG and S. DE BOER (Z. ges. exp. Med., 1939, **105**, 95—99).—2 types of electrical and mechanical alternation of the ventricles were observed after subcutaneous injection of a 0·1% solution of erythrophloein in frogs. A. S.

Electrocardiogram in pericarditis. P. MARRE (Rev. Méd., 1939, **56**, 141—157).—A review. H. B. C.

Changes in heart rhythm produced by injecting fluid into pericardium. A. TOURNADE, J. TORREILLES, and G. CHARDON (Compt. rend. Soc. Biol., 1939, **131**, 332—335).—The slowing of the heart produced by the injection of fluid under pressure into the pericardium of the dog is partly due to vagal stimulation caused by cerebral anæmia and partly to the direct effects of lack of blood in the myocardium. P. C. W.

Mechanism of cardiac disturbances caused by injection of fluid into pericardium. A. TOURNADE and G. CHARDON (Compt. rend. Soc. Biol., 1939, **131**, 336—339).—Since the cardiac effects of the injection of fluid under pressure into the pericardium in the dog are reproduced by simple pinching of the pericardium, it is presumed that the effects are the result of preventing the full development of diastole. P. C. W.

Measurement of heart size with Roentgen-kymograph. A. KEYS and H. L. FRIEDELL (Proc. Soc. Exp. Biol. Med., 1939, **40**, 267—270).—By movement of a film behind a lead grid it is possible to record the excursions of the heart and the upper and lower borders. Heart vol. is equal to $0{\cdot}63 \times A^{1{\cdot}45}$, where A is the area of the frontal heart silhouette. V. J. W.

Heart in anæmia. L. B. ELLIS and J. M. FAULKNER (New England J. Med., 1939, **220**, 943—952).—47 patients with severe chronic anæmia were studied; the majority presented cardiac enlargement, systolic murmurs, lowering of systolic and diastolic blood pressure, with return to normal of these features after control of the anæmia. 10 of the cases, with hæmoglobin levels of under 25%, showed abnormal e.c.g. records. A. M. G.

Changes in heart muscle in insulin shock. W. HADORN and B. WALTHARD (Z. ges. exp. Med., 1939, **105**, 174—179).—Neither insulin shock nor prolonged administration of insulin produced any changes in the heart muscle of rabbits. A. S.

Embolic manifestations of heart disease. F. A. WILLIUS (Proc. Staff Mayo Clin., 1939, **14**, 325—327).—The causes, manifestations, and treatment of arterial emboli are considered. A. M. G.

Cardio-pericardial adhesions following use of talc. S. A. Thompson (Proc. Soc. Exp. Biol. Med., 1939, **40**, 260—261).—Talc placed in the pericardium of dogs produced permanent vascular adhesions. V. J. W.

Simplified heart oxygenator circuit. J. Y. Bogue and R. A. Gregory (Quart. J. Exp. Physiol., 1939, **29**, 105—109).—A const.-level pump heart oxygenator prep. is described in which defibrinated blood is pumped through the oxygenator at a const speed independent of the cardiac output. T. S. G. J.

Effect of adrenaline and acute anoxia together on the heart-glycogen. J. Y. Bogne, C. L. Evans, and R. A. Gregory (Quart. J. Exp. Physiol., 1939, **29**, 83—90).—In the heart–lung or heart–oxygenator circuit rapid anoxia produced by CN′ or ventilation by $N_2 + CO_2$ mixture causes only a small disappearance of heart-glycogen. Anoxia in presence of adrenaline causes a more rapid progressive depletion of glycogen, more pronounced with CN′, and more rapid than that caused by adrenaline alone. T. S. G. J.

Usage of pyruvate by dog's heart. E. Braun-Menendez, A. L. Chute, and R. A. Gregory (Quart. J. Exp. Physiol., 1939, **29**, 91—104).—No change occurs to Na pyruvate when added to blood and kept at 37° for some hr. In the heart–lung or heart–oxygenator prep., the effect of pyruvate is similar to that of lactate but it is toxic in concn. of 150 mg.-%. Pyruvate does not form heart-glycogen. The pyruvate usage of the heart is large and is related to the pyruvate concn. of the circulating blood. It is not, however, affected by changes in blood-sugar or -lactate or by the presence of iodoacetate, aneurin, or adrenaline. T. S. G. J.

Oxygen consumption and debt in cardiac cases. Y. Bouvrain (Rev. Méd., 1939, **56**, 128—140).—In mitral cases, there is a normal basal O_2 consumption associated with a high O_2 debt after effort; these findings are independent of cardiac insufficiency. H. B. C.

Probable error of blood pressure measurements. N. W. Shock, E. Ogden, and K. Heck (Quart. J. Exp. Physiol., 1939, **29**, 49—62).—After elimination of temporal differences and differences between 2 arms, systematic differences between different observers were insignificant although significant differences in the variability of determination made by different observers were found. The probable error of a single blood pressure observation is 1·2—1·8 mm. for systolic and 1·8—2·0 mm. for diastolic pressures when readings were made under conditions of rest and adequate time was allowed for the establishment of postural equilibrium. The gain in precision for averaging successive readings was greater for diastolic than for systolic pressure. An average of more than 5 readings of blood pressure did not result in a useful gain in precision. T. S. G. J.

Blood pressure determination in the palmar arch. W. Hauss (Z. ges. exp. Med., 1939, **105**, 187—191).—Systolic pressure in the palmar arch, determined with a finger plethysmograph using a photocell, was the same as that in the brachial artery. A. S.

Effect of 3-piperidinomethyldioxan (933 F.) on nerve-endings of carotid sinus. M. Wierzuchowski and Z. Bielinski (Compt. rend. Soc. Biol., 1939, **131**, 269—270).—Using the gaseous perfusion technique, the effects of different concns. of 933 F. on the isolated innervated carotid sinus of the chloralosed dog were studied. 0·1% solutions had no effect; 0·15% solutions abolished all response although the carotid sinus nerve still responded to faradic stimuli. The excitability of the nerve was abolished by contact with a 2% solution. P. C. W.

Effect of carbon monoxide on vasomotor reactions. H. W. Kayser (Arch. exp. Path. Pharm., 1939, **192**, 625—633).—The rise of blood pressure after breathing O_2 containing 10% CO_2 in cats can be prevented by adding 10% CO to the gas mixture. The blood pressure rise due to asphyxia is also prevented by CO. This effect is due to a direct action of CO on the vasomotor centre. H. Bl.

High blood pressure in man. G. W. Pickering (Proc. Staff Mayo Clin., 1939, **14**, 310—316).—A review. A. M. G.

Hypertension due to stimulation of the central vagus and sympatholytic drugs. U. Lombroso and V. Martini (Biochim. Terap. sperim., 1939, **26**, 193—202).—The hypertension (dog) is not produced by concomitant cessation of respiratory movements or by excitation of the cervical sympathetic. Caffeine, 933 F., or atropine does not inhibit the hypertension. F. O. H.

Experimental hypertension. Kieselguhr injection and splanchnic stimulation. R. D. Cressman and A. Blalock (Proc. Soc. Exp. Biol. Med., 1939, **40**, 258—260).—No lasting rise of blood pressure could be produced in dogs by injection of kieselguhr into one or both renal arteries or by stimulation of the splanchnic nerves for up to 17 days. V. J. W.

Hypertension from obstruction of the aorta. R. J. Brotchner (Proc. Soc. Exp. Biol. Med., 1939, **40**, 264—265).—Partial or complete occlusion of the aorta in the anæsthetised dog causes a rise in the carotid blood pressure. V. J. W.

New examples of compensatory hypertension. A. Tournade and G. Chardon (Compt. rend. Soc. Biol., 1939, **131**, 340).—Temporary occlusion of the venæ cavæ, pulmonary artery, aorta, or brachiocephalic artery produces a fall in blood pressure followed by a compensatory hypertension due to central vasomotor action and adrenaline secretion. P. C. W.

Unilateral renal disease with arterial hypertension. J. D. Barney and H. I. Suby (New England J. Med., 1939, **220**, 744—746).—Report of a case in which nephrectomy reduced the blood pressure from 200/170 to normal, where it has remained for 21 months. A. M. G.

Increase of blood pressure by perfusion of ischæmic kidneys of hypertensive dogs. J. J.

BOUCKAERT, K. S. GRIMSON, and C. HEYMANS (J. Physiol., 1939, **96**, 44—46P).—Under certain experimental conditions the incorporation of the kidneys of a renal-ischæmic hypertensive dog into the circulation of another normal dog produces an elevation of blood pressure (confirming Fasciolo *et al.*; cf. A., 1939, III, 239). The liberation of this not very active vasopressor renal factor must, in order to be able to induce a sustained high blood pressure, be associated with either a primary or a secondary disturbance of the physiological mechanisms of the proprioceptive homœostatic blood pressure regulation. J. A. C.

Pressor response of hypertensive rabbits to tyramine and posterior pituitary extract. G. M. BROWN, F. J. MCLEAN, and B. G. MAEGRAITH (J. Physiol., 1939, **96**, 46—48P).—In the early stages of hypertension, produced in rabbits by constricting one or both renal arteries (cf. A., 1939, III, 562), there is an increased sensitivity to both tyramine and infundin. The degree of increased sensitivity is not related to the extent of the hypertension. J. A. C.

Blood pressure response of hypertensive patients to acetyl-β-methylcholine. D. E. ENGLE and M. W. BINGER (Proc. Staff Mayo Clin., 1939, **14**, 341—343).—The peripheral blood vessels of most hypertensive patients react by a greater proportional dilatation after administration of acetyl-β-methylcholine than do normals, thus supporting the hypothesis of a deficient acetylcholine-vasodilator mechanism as a factor in the production of human arterial hypertension. A. M. G.

Rôle of tyramine in arterial hypertension. H. ROBBERS and O. WESTENHOEFFER (Z. ges. exp. Med., 1939, **105**, 180—186).—The increase in arterial pressure after intravenous injection of tyramine is prevented or abolished by cocaine. The increase in arterial pressure in dogs after ligature of one renal artery is not influenced by cocaine. A. S.

Vasoconstrictor substances from serum and blood. A. SIMON and A. KOMLÓS (Arch. exp. Path. Pharm., 1939, **192**, 701—707).—Cat's serum raises the blood pressure of the decapitated rat; the pressor effect is the same in sera of animals made anæmic by hæmorrhage. Alcoholic extracts of fresh cat's blood contain an adrenaline-like pressor substance. The rats are sensitised to this substance by cocaine; after ergotamine the extracts cause a fall in blood pressure. H. BL.

Hypersensitiveness to cold with paradoxical adrenaline-like systemic reaction. B. T. HORTON and G. M. ROTH (Proc. Staff Mayo Clin., 1939, **14**, 419).—Following thyroidectomy for thyrotoxicosis, a woman developed white and swollen fingers on exposure to cold and at the same time a transitory rise in blood pressure. Daily immersions of one hand in ice water for several weeks abolished the finger response to cold but the patient developed a sustained hypertension. A. M. G.

Chronic organic arterial disease. E. A. EDWARDS (New England J. Med., 1939, **221**, 251—260).—A summary of the pathology, diagnosis, and treatment of arteriosclerosis and thromboangiitis obliterans of the peripheral arteries. A. M. G.

Padutin and disturbances of peripheral circulation. H. DIBOLD (Wien. klin. Wschr., 1939, **52**, 682—684).—Padutin was, in some cases, successfully used in patients with disturbances of cerebral and peripheral circulation. A. S.

Action of drugs on veins. R. DOMENJOZ and A. FLEISCH (Arch. exp. Path. Pharm., 1939, **192**, 645—663).—The effects of perfusion of the abdominal veins *in situ* with different sympathomimetic substances were studied. The least active substances are those without a phenolic hydroxyl group; *p*-monophenols are more active than and *m*-monophenols are as active as pyrocatechol derivatives. H. BL.

Vital importance of the lymphatic hearts in the toad. V. G. FOGLIA (Rev. Soc. argent. Biol., 1939, **15**, 97—107).—The 4 lymphatic hearts of *B. arenarum* were destroyed by cauterisation. All the animals died within 4 days of the operation; 87% within 48 hr. Body-wt. increased 20% on the 1st day and 40% on the 2nd day owing to absorption of water and accumulation of lymph in the lymphatic sacs. The blood became greatly conc. If one heart continued to beat the animal survived in an apparently normal state. If the operation was performed in two stages with an interval of 1 week survival time was prolonged and occasionally death did not occur. Intravenous injection of 0·8% NaCl in 4% gum acacia solution did not modify the results. Two series of animals were kept in tap- and distilled water respectively, without altering the results. In an atm. saturated with water no wt. increase took place; in a cold dry atm. a slight loss of wt. occurred, but length of survival was not modified. Submersion in 0·8% saline produced the usual increase in wt.; in more conc. solutions (1 or 2—10%) loss of wt. occurred; in all cases the animals died within 4 days of the operation. J. T. L.

Circulatory and humoral alterations produced by destruction of the lymphatic hearts of the toad. V. G. FOGLIA and R. GERSCHMAN (Rev. Soc. argent. Biol., 1939, **15**, 113—124).—After destruction by cauterisation of the 4 lymphatic hearts of *Bufo arenarum* the blood vol. (bleeding method) decreased considerably. Hæmolysis occurred and progressively increased; the blood became more conc.; the cell vol. was 45—83%; the red cell count rose from 700,000 to 1,250,000 per cu. mm. in 2 days. Concn. of hæmoglobin and blood-N increased to 2—3 times normal; the latter is due mostly to the increase in hæmoglobin, since the increase in plasma-N was less marked. Blood-water decreased. The red cells lost Cl, Na, and K; plasma-Na and -Cl decreased; this explains the fall in Δ and the hæmolysis. Plasma-K increased. These blood changes caused a decrease in blood pressure, stagnation of blood in the capillaries, and diminished urinary flow. In the liver and muscles there was an important loss of Cl and K. An increase in water due to interstitial œdema and decrease in protein occurred in muscle but not in the liver. The lymph vol. increased, its protein content reached 2·05%,

and K, Na, and Cl increased to the same level as was found in the blood. Death was due to the loss of water and salts, perhaps also of protein, from the blood and tissues, which accumulate in the lymphatic sacs. J. T. L.

(vii) RESPIRATION AND BLOOD GASES.

Bacterial filtering efficiency of the human nose. R. Rooks (Amer. J. Hyg., 1939, **30**, A, 7—10).—An apparatus for determinations is described. 300 readings taken on 7 subjects showed that dosage had little effect on the bacterial filtering efficiency. The efficiency of nasal filtration was greater for droplets of 1·0 mm. than for those of 0·01 mm.; this suggests that "droplet nuclei" are of more importance than "droplets proper." Nasal resistance and filtering efficiency were not related. B. C. H.

Nasal damage in people exposed to vapours containing chromium. G. Manzioli (Arch. ital. Otol., 1939, **51**, 24—37).—Inhalation of Cr vapours causes necrosis of the cartilage of the nasal septum and damages the mucous membrane exposed to the air during respiration. C. E.

Urinary ammonia, alkali reserve, and alveolar carbon dioxide in adenoids. T. Rodolfo-Masera (Valsalva, 1939, **15**, 97—121).—Urinary NH_3 was decreased, alkali reserve and alveolar CO_2 increased, after removal of adenoids. C. E.

Action of glucose in chronic hypertrophic rhinitis. M. Baer (Mschr. Ohrenheilk., 1939, **73**, 108—109).—Good results in cases of hypertrophic rhinitis were obtained with submucous injections of 50% glucose. C. E.

Potentiation by eserine of bronchoconstriction. J. W. Thornton (J. Physiol., 1939, **96**, 53—55P).—Contrary to the findings of Dale and Narayana (cf. Physiol. Abs., 1937, **21**, 846), eserine potentiates bronchoconstriction produced by acetylcholine and by stimulation of the cervical vagus in isolated guinea-pig lungs; there are, however, differences between the perfusion fluids used in the two series of experiments. J. A. C.

Bilharzial asthma: new type of allergic bronchial asthma. F. Mainzer (J. Allergy, 1939, **10**, 349—363).—This type of asthma occurs in the generalised disease and improvement coincides with sp. treatment of the disease. Asthma is not due to anatomical changes in the lungs, since these persist long after the asthma has disappeared. C. J. C. B.

Rôle of allergy in bronchiectasis. S. H. Watson and C. S. Kibler (J. Allergy, 1939, **10**, 364—373).—In 46 cases of bronchiectasis a high % showed evidence of allergy based on the presence of hay fever, asthma, nasal polyps, atopic dermatitis, or abnormal amounts of eosinophils in nasal or bronchial secretions (excluding skin tests entirely). Bronchiectasis can be closely simulated by basal allergic bronchitis, the only distinguishing evidences being lipiodol *X*-ray examination. Bronchiectasis in the majority of patients can be favourably influenced by allergic management. C. J. C. B.

Excitation mechanism of chemoreceptors of carotid body. U. S. von Euler, G. Liljestrand, and Y. Zotterman (J. Physiol., 1939, **96**, 42—44P).—Stepwise reduction of the no. of fibres carrying impulses, down to a few fibres only, cuts down the no. of potentials set up by O_2 lack and by CO_2 in about the same proportion, which suggests identical receptors (nerve of Hering, cat; chloralose or urethane). Both factors act by a common mechanism, most probably connected with a change in reaction to the acid side in the sensitive cells. A dose of NH_3 sets out of action the chemical receptors responding to O_2 lack and CO_2, leaving the presso-receptors still active; NH_3 neutralises the increase in acidity within the reacting cells, caused by O_2 lack and CO_2. J. A. C.

Respiratory accelerator action of carotid sinus–cardiac depressor mechanism. R. C. Partridge (J. Physiol., 1939, **96**, 233—239).—The acceleration of breathing produced by an electrical excitation of the vagus (cat, rabbit, dog), as described by Hammouda and Wilson (cf. Physiol. Abs., 1935, **20**, 308, 668), is due to stimulation of afferent cardiac fibres. When the lungs are distended the acceleration is the result chiefly of the activity of the carotid sinus–cardiac depressor mechanism. It is not necessary to assume, as the above authors did, the presence of a new augmentor fibre in the vagus. J. A. C.

Pulmonary lesions produced by vagotomy. C. Gernez, A. Breton, and J. Driessens (Compt. rend. Soc. Biol., 1939, **131**, 353—354).—Following unilateral or bilateral vagotomy in the rabbit pulmonary lesions develop. The lesions are characterised by atelectasis, inflammatory changes in the alveoli with exudation, congestion of the inter-alveolar capillaries, and erythro-diapedesis. P. C. W.

Apnœa from transverse section of pons in the dog. G. Stella (Arch. int. Pharmacodyn., 1939, **62**, 135—148).—Apnœa caused by pontine transverse section is abolished by pressure on the chest wall. On cessation of pressure respiration ceases. Continued deflation, or abolition of vagal conductivity, induces prolonged inspiratory cramp. The ponto-bulbar centre is similar to Lumsden's apneustic centre, which seems to be the normal seat of inhibition of excessive bulbar response to proprioceptive chest impulses. The prep. is useful for examining cardiac response to pulmonary deflation. D. T. B.

Visco-elastic properties of lungs. L. E. Bayliss and G. W. Robertson (Quart. J. Exp. Physiol., 1939, **29**, 27—47).—A simple harmonic pump is used alternately with an "Ideal" pump to ventilate the lungs of decerebrate or narcotised cats. A manometer indicator, which moves horizontally on a smoked plate moving vertically with the pump piston, allows records to be made of the phase difference between lung pressure and pump stroke. Measurement of the elliptical records provides independent evaluation of the viscous and elastic forces under these conditions. The viscous and elastic forces developed per unit vol. of tidal air are defined as the viscance and elastance respectively. The viscance may be divided into two parts, (*a*) due to flow through air passages and (*b*) due to deformation of the lung tissue. These

may be measured by ventilation with O_2–H_2 mixtures. At a frequency of 18 respirations per min., elastance contributes 80%, structure viscance 15%, and the air viscance 5% of the resistance to air flow. The structure viscance is independent of, and the air viscance proportional to, the frequency. Preliminary results are reported of the action of vagal stimulation and of drugs. Pilocarpine increased the elastance and structure viscance without affecting the air viscance. T. S. G. J.

Variations in pulmonary vital capacity in health: daily, seasonal, and at moderate altitudes. F. L. Apperly (Proc. Soc. Exp. Biol. Med., 1939, **40**, 294—298).—Vital capacity diminishes at moderate altitudes, change appearing at 3000 ft. It is probably due to dilatation of lung capillaries under lowered atm. pressure in the alveoli. V. J. W.

Effect of vagotonin on apnœa following pulmonary hyperventilation. R. Grandpierre, C. Franck, and M. Vidacovitch (Compt. rend. Soc. Biol., 1939, **131**, 321—323).—Vagotonin diminishes the duration of the apnœa that follows hyperventilation. P. C. W.

Oxygenator with large surface volume ratio. J. H. Gibbon, jun. (J. Lab. clin. Med., 1939, **24**, 1192—1198).—The oxygenator is capable of introducing as much as 18 c.c. of O_2 per min. and deals with rates of flow of from 60 to 600 c.c. per min. without foaming. C. J. C. B.

Indirect determination of gas tensions in mixed venous blood. I. F. S. Mackay (J. Physiol., 1939, **96**, 9—20).—The method is divided into two separate processes; in the first, the lungs are washed out with a mixture which leaves the pulmonary gas tensions as near as possible to those in the mixed venous blood. In the second process, the process of equilibration which immediately follows, rebreathing from a 4-l. rubber bag is carried out. To bring the gases in this lung-bag system into equilibrium with the gases in the mixed venous blood the following conditions must be satisfied: (1) a correct washing out mixture must be used; (2) a "secondary plateau" must be produced; (3) each experiment must be completed within the circulation time; (4) complete and thorough mixing of the lung and bag gases must take place. J. A. C.

Alveolar air on Mount Everest. C. B. M. Warren (J. Physiol., 1939, **96**, 34—35P).—The average figures during rest at 23,000 ft. were 16·5 mm. CO_2 pressure and 35·7 mm. O_2 for Warren and Odell in 1938, compared with 19·3 mm. CO_2 and 38·8 mm. O_2 obtained by Greene or himself at the same altitude in 1933. J. A. C.

Reversibility of effects of oxygen and carbon dioxide in blood. J. Ettori and R. Grangaud (Compt. rend. Soc. Biol., 1939, **131**, 266—268).—While the effects of an increase in the O_2 tension of the blood on the erythrocyte vol. are readily reversed, this is not so with the changes effected by an increase in CO_2 tension. P. C. W.

Alveolar carbon dioxide changes from carbon dioxide baths. P. D. Vieregge (Z. ges. exp. Med., 1939, **105**, 266—272).—Alveolar CO_2 is increased and pulmonary ventilation is decreased as a result of a lukewarm bath. The increase in alveolar CO_2 in a CO_2-containing bath is attributed to the inhalation of CO_2, as the respiratory vol. is often augmented. A. S.

Action of carbon dioxide on *Rhytidoderes plicatus*, Ol. R. Pussard and P. Nepveu (Compt. rend. Soc. Biol., 1939, **130**, 1479—1480).—Two phases are observed in the asphyxia of the larva and adult insect by CO_2: in the first the reflexes are not abolished and activity is recovered in ¼ hr., in the second the reflexes are abolished and return only after several hr. with disturbance of the nervous system. H. G. R.

Effect of oxygen pre-breathing on anoxæmia in albino rats. F. M. Baldwin and H. D. Robinson (Proc. Soc. Exp. Biol. Med., 1939, **40**, 255—256).—Resistance to anoxæmia was increased by preliminary breathing of O_2 during an optimum period of 70 min. V. J. W.

Responses to anoxia. G. Zaeper (Klin. Woch., 1939, **18**, 949—952).—A review. E. M. J.

Zein and resistance to oxygen want. J. Argyll Campbell (J. Physiol., 1939, **96**, 33P).—Zein is the only protein so far tested which may form 12—50% of a diet (starch mainly) and give protection in white rats against O_2 want similar in extent to that of a pure carrot diet. Amino-acids which aid such protection include tryptophan, tyrosine, lysine, and glutamic acid; adverse effects are obtained with histidine, arginine, and cystine. Unoxidised poisons in the alimentary canal are held responsible for these adverse effects and bacterial flora may be concerned. (Cf. A., 1938, III, 790; 1939, III, 366.) J. A. C.

Effect of histamine on pleural pressure in dog. G. Bizard, H. Warembourg, and E. Laine (Compt. rend. Soc. Biol., 1939, **131**, 352—353).—Histamine injection in the chloralosed dog causes a decrease in pleural pressure, polypnœa, and increased respiratory amplitude. P. C. W.

Thoracic surgery. E. D. Churchill (New England J. Med., 1939, **220**, 998—1004). A review of progress. A. M. G.

(viii) MUSCLE.

Electrical impedance of muscle during action of narcotics and other agents. R. Guttman (J. Gen. Physiol., 1939, **22**, 567—591).—Na, K, and Mg have little effect on the resistance of sartorius muscle in the frog; Ba and Ca cause it to fall. The rate of penetration of glucose into the intercellular spaces was determined by following the effect on resistance of application of glucose solution. An upper limit for the time necessary for inorg. cations and org. narcotics to reach the cell surfaces was thus obtained; the results showed that the action of these substances on muscle is slow compared with the time necessary to reach the site of action. The org. narcotics studied all decreased the resistance if their concn. was sufficiently high. Low concns. may increase resistance. During narcosis the resistance

of the fibre membranes first increases, then decreases and may disappear. D. M. N.

Effect of barbiturates on response of amphibian muscle to electrical stimulation. G. WEILER (J. Physiol., 1939, **96**, 51—52 P).—Under isotonic and isometric conditions, the Na salts of barbituric acid derivatives cause a sustained increase in the force of contraction of the frog's isolated rectus abdominis (const. break shocks; 10 sec. intervals). The relative potencies of 6 barbiturates investigated are of the same order as their relative anæsthetic activities. KCl in concn. 4 times that of frog Ringer solution produces a similar effect which can be superimposed on the barbiturate potentiation. Eserine and curarine do not modify the effect, nor do certain other substances which reverse certain of the clinical effects of barbiturate intoxication. J. A. C.

Choline-esterase content of muscle and serum. M. S. JONES and W. C. STADIE (Quart. J. Exp. Physiol., 1939, **29**, 63—67).—In 1 case of myasthenia gravis, the choline-esterase content of the affected muscle was essentially the same as that of 2 specimens of normal human muscle. The mean choline-esterase content of the serum of 76 miscellaneous psychotic states was slightly lower than normal. In advanced phthisis and carcinoma markedly lower vals. were found. T. S. G. J.

Release of histamine by skeletal muscles. G. V. ANREP, G. S. BARSOUM, M. TALAAT, and E. WIENINGER (J. Physiol., 1939, **96**, 240—247).—During contraction of skeletal muscles (dog) histamine appears in the venous blood in an active form; its effect can be demonstrated with untreated plasma. The pre-existing store of histamine in the muscle diminishes during prolonged contraction and the histamine is not newly formed. Contractions of denervated muscles lead to a similar release of histamine. During the early stage of motor nerve degeneration there is a small continuous output of histamine due to fibrillary twitches of the muscle. Strychnine and picrotoxin convulsions increase the histamine equiv. of arterial blood; part of the histamine comes from the contracting muscles. The intravenous injection of picrotoxin diminishes the sensitivity of the animal to histamine. J. A. C.

Peripheral action of tetanus toxin [on skeletal muscle]. A. M. HARVEY (J. Physiol., 1939, **96**, 348—365).—A detailed account of work already noted (cf. A., 1939, III, 566). J. A. C.

(ix) NERVOUS SYSTEM.

Nerve network in tail membrane of tadpoles examined *in toto*. J. TUSQUES (Compt. rend. Soc. Biol., 1939, **131**, 259—262). P. C. W.

Membrane and protoplasm resistance in the squid giant axon. K. S. COLE and A. L. HODGKIN (J. Gen. Physiol., 1939, **22**, 671—687).—The d.c. longitudinal resistance of the squid giant axon was measured as a function of the electrode separation. The slope of the resistance–separation curve is large for small electrode separation, but becomes smaller and finally const. as the separation is increased. Analysis of the curves shows (*a*) that the nerve membrane has a resistance of about 1000 Ω.; (*b*) that the protoplasm has a sp. resistance about 1·4 times that of sea-water; (*c*) the resistance of the connective tissue sheath outside the fibre corresponds with a layer of sea-water about 20 μ. in thickness. D. M. N.

Electric impedance of the squid giant axon during activity. K. S. COLE and H. J. CURTIS (J. Gen. Physiol., 1939, **22**, 649—670).—During the passage of an impulse, the membrane phase angle was unchanged, the membrane capacity decreased by 2%, and the membrane conductance fell from 1000 Ω. cm.^{2} to an average of 25 Ω. cm.^{2} The onset of the resistance change occurs after the start of the monophasic action potential and coincides with the point of inflexion where the membrane current reverses in direction. This e.m.f. and the conductance are closely associated properties of the membrane. D. M. N.

Neuro-muscular junction. XIII. Localised electrical negativity of muscle around neuro-muscular junction due to high-frequency nerve stimulation. T. P. FENG (Chinese J. Physiol., 1939, **14**, 209—224; cf. A., 1938, III, 382, 792).—During high-frequency nerve stimulation and accompanying the development of Wedensky inhibition at the neuro-muscular junctions, a localised electrical negativity in the innervated portion of the muscle corresponding with the localised contraction previously demonstrated is obtained. An electrical method of recording the phenomenon is described which is superior to the double myograph and double thermopile methods previously used in being applicable not only to the amphibian sartorius but also to the toad gastrocnemius and the cat soleus muscle. A condition of persisting negativity occurs in these muscles following a tetanic contraction, the magnitude of negativity increasing with the size of the previous contraction. The various conditions affecting the development of Wedensky inhibition and its accompanying localised contraction are critically examined. Difficulties arise in interpreting all cases of localised contraction as primarily due to accumulation of acetylcholine near the nerve endings. Alternative interpretations are considered. F. H.

Persistent effects of electrotonus on the excitability of nerve. M. NIVET (Compt. rend. Soc. Biol., 1939, **131**, 262—266). P. C. W.

Stimulation produced by a single alternating impulse of short duration. P. FABRE (Compt. rend. Soc. Biol., 1939, **131**, 251—254).—A single negative wave applied to the nerve of a nerve–muscle prep. was followed at an interval (t) by a positive wave of the same dimensions. The following relation was found to hold: $(Q - Q_0)/Q_0 = K/2t = KN$, where Q is the quantity of electricity necessary to produce stimulation when the interval between the two opposing stimuli was t, Q_0 is the liminal quantity after a single negative wave, and N is the frequency of the waves. P. C. W.

Curarisation and chronaxie. P. DE B. CARNEIRO (Ann. Inst. Pasteur, 1939, **63**, 93—100).—Under the influence of strychnolethaline or of curare, direct muscle chronaxie in the monkey is greatly

increased; chronaxie to nerve stimulation is unaffected. The normal impulse through a motor nerve is believed not to be electrical in nature. G. P. G.

Peripheral neuritis: allergy to honeybee stings. A. T. Ross (J. Allergy, 1939, **10**, 382—384).—A case is reported of peripheral neuritis apparently due to hypersensitivity to allergens inherent in the honeybee. C. J. C. B.

Diastase content of denervated fat tissue. F. X. Hausberger and N. Neuenschwander-Lemmer (Arch. exp. Path. Pharm., 1939, **192**, 530—535).—10—20 days after the denervation of the interscapular body of the mouse its diastase content is raised; after 40—50 days it is lower than that of the normal side. H. Bl.

Specific gustatory impulses. C. Pfaffman (J. Physiol., 1939, **96**, 41—42p).—There are 3 main types of fibre in the chorda tympani nerve (cat, decerebrated or under dial; Matthews oscillograph): (1) those responding only when HCl or acetic acid is placed on the tongue, (2) those responding to NaCl and to acid, (3) those responding to quinine and to acid. There is some peripheral sensory structure which responds specifically to certain gustatory stimuli, but not to others, providing an afferent mechanism for qual. gustatory discrimination. J. A. C.

Stimulation of sensory somatic nerves in relation to the viscero-pannicular reflex. D. M. Ashkenaz (Proc. Soc. Exp. Biol. Med., 1939, **40**, 266—267).—Faradisation of the sciatic or phrenic nerve in cats does not cause contraction of the panniculus muscle. V. J. W.

Relation between central and peripheral motor excitability during narcosis in frog. P. Chauchard and J. Chauchard (Compt. rend. Soc. Biol., 1939, **131**, 174—176).—During anæsthesia with $CHCl_3$, chloral, or evipan in the frog, the chronaxie of the motor centre for hind limb flexion, after a short phase of hyperexcitability, is raised progressively until the centre is inexcitable; during this rise the chronaxie of the peripheral nerves concerned is also raised, that of the extensors more than that of the flexors. These vals. return to normal when the centre becomes inexcitable. P. C. W.

Differentiation of spinal ganglion cells in tissue cultures. J. Szepsenwol (Rev. Soc. argent. Biol., 1939, **15**, 75—81).—Spinal ganglia from chick embryos 6—9 days old were cultivated *in vitro*. The bipolar cells continued to differentiate into unipolar cells; numerous transitional phases were seen, together with some atypical cells. The differentiation is somewhat accelerated *in vitro*. J. T. L.

Effect of destruction of spinal cord, stellate ganglia, and vagi in dog. H. Hermann, F. Jourdan, G. Morin, and J. Vial (Compt. rend. Soc. Biol., 1939, **131**, 284—286).—Following destruction of the thoracic, lumbar, and sacral cord and the 2 stellate ganglia and section of the right vagus in a dog the blood-pressure soon returned to normal. 86 days after the operation the left vagus was cut. The animal survived 13 days, during which period there was no change in blood-pressure, blood-sugar, or glucose tolerance. Respiration was typical of that in the bivagotomised dog. The heart rate was 110 per min. with a normal sinus rhythm. P. C. W.

Acetylcholine synthesis in sympathetic ganglion. G. Kahlson and F. C. MacIntosh (J. Physiol., 1939, **96**, 277—292).—The perfused superior cervical ganglion (cat) synthesises acetylcholine during prolonged stimulation (confirming Brown and Feldberg; cf. Physiol. Abs., 1936, **21**, 273). Only a limited synthesis occurs when the perfusion fluid contains only inorg. salts; a ganglion so perfused rapidly fatigues when its preganglionic fibres are stimulated, since its stock of acetylcholine soon becomes exhausted. This fatigue can be removed by addition to the perfusion fluid of glucose, mannose, galactose, lactate, or pyruvate; these promote synthesis of acetylcholine. Fructose, sucrose, lactose, arabinose, *dl*-glyceraldehyde, acetate, acetoacetate, succinate, and acetaldehyde are ineffective. When the perfusion fluid contains glucose, fatigue develops very slowly with preganglionic stimulation; inadequate acetylcholine synthesis here is due in part to anoxia. J. A. C.

Surgery of sympathetic nervous system. R. H. Smithwick (New England J. Med., 1939, **220**, 475—479).—A review. A. M. G.

Myelencephalic sympathetic centre. VIII. In fish. Y. M. Lü (Chinese J. Physiol., 1939, **14**, 225—230; cf. A., 1938, III, 24).—The myelencephalic sympathetic centre of *Ophiocephalus argus*, Cantor, and *Clarias fuscus* can be located by pigmentary or pressor responses to stimuli. The pigmentary changes caused rapidly by electrical stimulation of the myelencephalic sympathetic centre, or gradually by the prolonged action of light on abdominally sympathectomised fish, suggest that sympathin is produced by intact nerve endings of innervated regions and invades the denervated area which, having been sufficiently sensitised, responds to the stimulus by concn. of the melanophores. F. H.

Vagus-poterior-pituitary reflex. VIII. Antidiuretic effect. H. C. Chang, K. F. Chia, J. J. Huang, and R. K. S. Lim (Chinese J. Physiol., 1939, **14**, 161—172; cf. A., 1938, III, 28).—Stimulation of the afferent vagus in the isolated head prep. of a dog under chloralosane anæsthesia produces diuresis. The antidiuretic activity of the dog's urine can be shown by parenteral administration to non-anæsthetised dogs or rats. This diuretic-antidiuretic effect is similar to that produced by pitressin and cannot be demonstrated in the complete absence of the pituitary gland. The effect is increased by crushing of the neck. F. H.

Muscular rigidities in cats. E. G. T. Liddell and C. G. Phillips (J. Physiol., 1939, **96**, 39—40p).—Using Adrian electrodes in a Souttar-Beattie stereotaxic apparatus, electrolytic lesions were placed unilaterally in various parts of the basal ganglia of the cat's brain; the animals were allowed to survive for 1 week—4 months. No rigidity is evident in the gait unless the lesion is extensive. When the cat is nursed comfortably on the observer's lap, marked "non-clasp-knife" extensor rigidity is evident in the

contralateral hind limb. Voluntary power is unimpaired in the rigid muscles, but the non-rigid limb is used in preference to the rigid limb. The head may be rotated and turned towards the side of the lesion. The eyelids are held immovably open, the nictitating membrane being used spontaneously or reflexly. In walking the animal circles towards the side of the lesion. As a result of deafferentation there appears to be reduction or banishment of the rigidity. J. A. C.

Localisation of narcotic action by electro-encephalogram. Z. Drohocki and J. Drohocka (Arch. int. Pharmacodyn., 1939, **62**, 265—280).—All cerebral narcotics act most strongly on the cortex, but affect the brain stem as well; they cannot be classified in two distinct groups. The changes of rhythmicity, automaticity, and electrical intensity of the encephalogram show that narcosis is not a phenomenon of inhibition. D. T. B.

Cortical alpha rhythm in thyroid disorders. D. A. Ross and R. S. Schwab (Endocrinol., 1939, **25**, 75—79).—80 determinations of basal metabolic rate and electro-encephalogram were made on patients with thyroid disorders. When the records were made under satisfactory basal conditions the correlation coeff. between frequency and basal metabolic rate was 0·392. When conditions were more lax the coeff. rose to 0·781. V. J. W.

Electro-encephalographic localisation of atrophy in cerebral cortex of man. M. A. Rubin (Proc. Soc. Exp. Biol. Med., 1939, **40**, 153—154).—Cortical atrophy can be localised by comparing the alpha rhythms of the two cerebral hemispheres with each other. V. J. W.

Insulin treatment of schizophrenia. I. Methods. E. M. Jellinek. **II. Pulse rate and blood pressure.** D. E. Cameron and E. M. Jellinek. **III. Serum-lipins.** L. O. Randall and E. M. Jellinek (Endocrinol., 1939, **25**, 96—99, 100—104, 105—110).—10 patients who recovered after treatment had an average blood pressure before treatment of 107 mm. Hg, which reached 116 mm. on recovery. 11 who did not recover had 114 mm. throughout. The former patients also had a slightly more variable pulse rate, which returned to normal on recovery. In the patients treated, serum-lipins, other than free cholesterol, were below normal and became normal after treatment, but among those who recovered there were finally fewer individual variations. V. J. W.

Factors involved in stability of therapeutic effect in metrazol treatment of schizophrenia. C. H. Cohen (New England J. Med. 1939, **220**, 780—783).—A study of 146 cases 6 months after treatment with metrazol, showing that results are best in young patients whose illness is of recent onset and in whom full remission of symptoms had occurred. A. M. G.

Metrazol treatment of depressions. F. Cottington and A. J. Gavigan (New England J. Med., 1939, **220**, 990—992).—Of 20 females suffering from involutional and manic-depressive psychoses, 17 showed full remission of symptoms and 3 were improved. A. M. G.

Heredity and mental defect: genetics of phenylpyruvic oligophrenia. G. A. Jervis (J. ment. Sci., 1939, **85**, 719—762; cf. A., 1939, III, 80).—Of 20,300 mental defectives tested, 161 excreted phenylpyruvic acid. From a study of these and their families it is concluded that phenylpyruvic oligophrenia is a type of mental deficiency determined by a single autosomol recessive gene. The ratio of affected to normal siblings in families with normal parents, when corr. by Weinberg's proband method, by Bernstein's method as modified by Weinberg, or by Sjögren's modification of Lenz's method, is 25%. The rate of consanguinity among the parents of affected individuals is above normal. The distribution of the character among ascendent and collateral relatives follows the rules of monomeric recessivity. G. D. G.

Blood-sugar regulation after extirpation of cerebral hemispheres. A. G. Beer and R. Richard (Z. ges. exp. Med., 1939, **105**, 123—137).—There is no difference in the daily blood-sugar fluctuations of normal cats and cats after extirpation of the cerebral hemispheres. The latter respond more markedly to oral administration of glucose than normals. A. S.

Variations in choline-esterase in brain and medulla of tetanus-infected animals. G. Pighini (Biochim. Terap. sperim., 1939, **26**, 226—227).—Injection of tetanus toxin into dogs and rabbits increases the choline-esterase content of the spinal medulla and, to a greater extent, that of the brain. F. O. H.

Choline-esterase in central nervous system. D. Nachmansohn (Bull. Soc. Chim. biol., 1939, **21**, 761—796).—The concn. of choline-esterase is comparatively low in white matter and invariably higher in grey matter. Although the vals. vary for different regions from one species to another, they are remarkably const. for similar regions in the same species. The concn. in the ganglia of the lobster is 2—4 times that in the connecting nerve fibres. Similar relations exist in the sympathetic nervous system. The concn. in the brain of the embryo chick rises rapidly immediately prior to hatching; a similar rise occurs in embryo guinea-pig brain. In mammals in which the brain is but little developed at birth (rat, rabbit) the concn. rises rapidly in the first weeks after birth. The difference between the region of the synapses and the fibres, as regards acetylcholine metabolism, is quant. rather than qual. The physiological function of the enzyme sytem may therefore be the rapid inactivation of liberated acetylcholine. P. G. M.

Enzymes in normal and pathological cerebrospinal fluid. I. Kaplan, D. J. Cohn, A. Levinson, and B. Stern (J. Lab. clin. Med., 1939, **24**, 1150—1171).—Normal c.s.f. contains small amounts of β-glycerophosphatase and amylase, and occasional traces of lipase, tributyrinase, and antitrypsin, but never trypsin or esterase. In tuberculous meningitis the fluid shows increased enzyme concn. with the presence of trypsin and phosphatase; both the latter were much increased in purulent meningitides. In patients with cerebral tumour, abscess, or cyst, or hydrocephalus the fluid varied

according as to whether the ventricles or meninges were invaded. With no invasion the fluid was normal but with invasion there was generally increased enzymic activity and antitryptic power.
C. J. C. B.

Treatment of traumatic increase of intracranial pressure with hypertonic sodium chloride. T. MARTINS and A. FIGUEIREDO (Bol. Secr. Ger. Saúde Assist., 1939, **5**, 93—117).—A report of 338 cases successfully treated with intravenous injections of hypertonic NaCl. S. O.

Nitrate and bromide tests for blood–central nervous system barrier permeability in experimental poliomyelitis. E. H. LENNETTE, D. H. CAMPBELL, and H. R. REAMES (Proc. Soc. Exp. Biol. Med., 1939, **40**, 287—289).—$NaNO_3$ and NaBr were injected into normal and infected monkeys and concn. of these salts in serum and c.s.f. was determined. In the case of NaBr the ratio serum-Br : c.s.f.-Br was 1 in the infected monkeys and 1·58 in normals. In the case of $NaNO_3$ the results were similar but less significant. V. J. W.

(x) SENSE ORGANS.

Arrests in embryological development as factors in vision. D. J. LYLE (Arch. Ophthal., N.Y., 1939, **21**, 1037—1954).—A review.
D. WH.

Bitôt's spots. A. MCKENZIE (Lancet, 1939, **237**, 341—342).—A report of the occurrence of Bitôt's spots of the foaming type in several cases of acute rather than chronic vitamin-*A* deficiency in African native police, school children, etc. Night blindness was always the first symptom and was followed by Bitôt's spots in about 25% of cases. K. T.

Distribution of sodium between cat's aqueous humour and blood plasma. H. DAVSON (J. Physiol., 1939, **96**, 194—201).—The mean val. of the ratios of concns. of Na in aq. humour and blood serum is 1·03 (theoretical val. 1·04). When blood is drawn off under nembutal anæsthesia, the mean ratio is not different from that obtained by heart puncture without general anæsthesia. The products of the concn. ratios of Na and Cl in the two fluids are not equal to 1 nor are they equal to one another. The variations in the val. of the ratio obtained for Na in serum and aq. humour of cats are rather less than variations in similar ratios for artificial systems tested.
J. A. C.

Uveal tissue sensitisation in rabbits by synergic action of staphylotoxin. H. LUCIC (Proc. Soc. Exp. Biol. Med., 1939, **40**, 273—275).—Uveal-tissue-toxin is prepared by incubating uveal tissue with a special strain of staphylococcus. Intracutaneous injection of this toxin from ox uvea sensitised 6 out of 22 rabbits to uveal pigment from ox or rabbit. Injection of toxin from rabbit uvea, or of uveal tissue alone, caused no sensitisation.
V. J. W.

Effect of extracts of ciliary body on intraocular pressure. D. MICHAIL and P. VANCEA (Compt. rend. Soc. Biol., 1939, **130**, 1041—1042).—Intravenous injection of dried extract of the ciliary body (0·6 g.) into dogs increases the intraocular pressure. P. C. W.

Partition of sodium, glucose, and urea between vitreous humour and serum in a selachian. Y. DERRIEN (Compt. rend. Soc. Biol., 1939, **130**, 1141—1144).—The ratio of vitreous humour-NaCl to serum-NaCl in *Scylliorhinus stellaris*, L., is 1·03. The ratio for glucose is 0·2—0·5 and for urea 0·86—0·94.
P. C. W.

Cæsium in mammalian retina. G. H. SCOTT and B. L. CANAGA, jun. (Proc. Soc. Exp. Biol. Med., 1939, **40**, 275—276).—Cs was found in all retinas examined spectrographically by the interrupted arc method, and identified by the line at 4555·5 A.
V. J. W.

Retinal arterial pressure in cases of intracranial tumour : its value in localisation and its rôle in production of papillœdema. G. DE MORSIER, M. MONNIER, and E. B. STREIFF (Rev. Neurol., 1939, **71**, 702—714).—The retinal arterial pressure as measured by Baillart's ophthalmodynamometer is usually lowered in tumours of the anterior and middle fossæ, and raised in tumours of the posterior fossa. The production of papillœdema is related to the ratio of the retinal arterial pressure to the intracranial pressure. D. WH.

Perception of illumination, a newly discovered function of the rods. S. KRAUSS (Acta ophthal. orient., 1939, **1**, 166—169).—Changes in the viewing medium under photopic, and in illumination under scotopic, conditions both induce the Purkinje phenomenon. The perception of illumination is thus a function of the rods. L. R. P.

Dark adaptation test. C. P. STEWART (J. Physiol., 1939, **96**, 28—29P).—There is no correlation between the response to the dark adaptation test and intake of vitamin-*A*. Nearly all subjects given large doses of -*A* show some improvement in dark adaptation; the greatest improvement is shown in those whose original adaptation was below the average. Oranges produce much greater improvement in dark adaptation than do eggs or tomatoes with equal content of potential -*A*. Ascorbic acid (150 mg. daily) produces as great improvement as does -*A* (24,000 units daily). Good adaptation is invariably shown by subjects with good intake of -*A* and -*C*.
J. A. C.

Alterations in dark adaptation under reduced oxygen tensions. R. A. MCFARLAND and J. N. EVANS (Amer. J. Physiol., 1939, **127**, 37—50).—Anoxia experimentally produced, over a range of simulated altitudes of from 7400 to 15,000 ft., gives increased dark adaptation thresholds, with rapid return to normal after O_2 administration. Such change is probably neural, and not photochemical, in origin. L. R. P.

Instruments and technique for clinical testing of light sense. II. Control of fixation in dark-adapted eye. III. Apparatus for studying regional differences in light sense. L. L. SLOAN (Arch. Ophthal., N.Y., 1939, **22**, 229—251; cf. A., 1939, III, 836).—II. Using the blind spot as an indicator, the efficiency of different forms of fixation

during dark adaptation is examined. A red fixation light is efficient for all but observation restricted to the fovea, when a perifoveal arrangement is necessary. Direction of vision to the centre of a test patch, without sp. fixation, as used by Ferree, Derby, and co-workers, is unsatisfactory.

III. An adaptometer, with independent fixation device, used with a perimeter, and suitable for the study of regional differences in the light sense under light and dark adaptation conditions, is described. Preliminary studies of five pathological cases show sp. qual. and quant. differences between them, and as compared with the normal eye. L. R. P.

Simple method of measuring brightness threshold of dark adapted eye at all ages. C. Haig and J. M. Lewis (Proc. Soc. Exp. Biol. Med., 1939, **41**, 415—418).—A portable adaptometer, with a 7° test patch, violet illumination, and a brightness range, calibrated in micromicrolamberts, of 1 : 100,000 is described. The technique employed is simple, and is said to make a fixation point unnecessary. L. R. P.

Dependence of contrast sensitivity of the eye on adaptation. A. I. Bogoslovsky (Ophthalmologica, 1939, **97**, 289—301).—An experimental study of changes in the brightness difference threshold under light and dark adaptation conditions, using red, blue, green, and white fields, with foveal observation. The difference threshold increases under light adaptation conditions. L. R. P.

Marked anisometropia. F. L. P. Koch and A. de H. Prangen (Arch. Ophthal., N.Y., 1939, **21**, 987—989).—A description of a case with bilateral irregular conic type of cornea and a severe degree of astigmatism. Full correction was possible and good second degree fusion, but no true stereopsis, was obtained. D. Wh.

Significance of false projection in treatment of squint. M. I. Smith (Arch. Ophthal., N.Y., 1939, **21**, 990—998).—The existence of false projection, viz., the fusion of an eccentric image in one eye with a true macular image in the other, is determined in the presence of squint by using the synoptophore. Abolition of false projection is essential to cure of the squint. D. Wh.

Occurrence of vertical anomalies associated with convergent and divergent anomalies. J. W. White and H. W. Brown (Arch. Ophthal., N.Y., 1939, **21**, 999—1009).—A vertical imbalance is an active factor in producing convergent and divergent strabismus and is frequently responsible for failures in treatment. D. Wh.

Form and extent of region of indistinct vision in quick forward motion. E. Weinberg (Acta ophthal. orient., 1939, **1**, 191—199).—Estimates of the limiting velocity of distinct vision, with and without nystagmus, indicate the general geometrical form of the region of indistinct vision, and its dependence on the velocity of the observing eye. The practical importance of the result is emphasised. L. R. P.

Form and extent of region of indistinct vision in quick forward motion. T. Motzkin (Acta ophthal. orient., 1939, **1**, 200—201).—The importance of Weinberg's result (see preceding abstract) is considered to be largely theoretical. L. R. P.

Frequency of blinking as clinical criterion of ease of seeing. M. Luckiesh and F. K. Moss (Amer. J. Ophthal., 1939, **22**, 616—621).—Frequency of blinking is related to complex physio-psychological factors involved in seeing, particularly to fatigue and "attention," and not to irritation of the cornea. During reading fatigue, poor illumination, and errors of refraction all increase the frequency of blinking, which may therefore be used for the investigation of visual effort, *i.e.*, the subjective experience of strain which accompanies voluntary effort. D. Wh.

Visual disturbances associated with tumours of temporal lobe. H. S. Sanford and H. L. Bair (Arch. Neurol. Psychiat., Chicago, 1939, **42**, 21—43).—An analysis of 211 cases of verified tumour of the temporal lobe. Homonymous hemianopia is the most common visual field defect found. Quadrantic anopias are produced much more frequently by temporal than by occipital lobe tumours. There is evidence for the existence of Meyer's geniculo-calcarine fasciculus from the external geniculate body looping forward around the inferior horn of the lateral ventricle. D. Wh.

Therapeutic action of sulphur vapour in otolaryngology. G. Donnadei (Boll. Mal. Orecch., 1939, **17**, 208—210). C. E.

Vitamin therapy in oto-rhino-laryngology. A. Erödi (Mschr. Ohrenheilk., 1939, **73**, 95—101).—Vitamin-*A*, especially combined with -*D*, increases the resistance to infections of the upper respiratory tract. -*B* is recommended in trigeminal neuralgia and in toxic facial and recurrent nerve paralysis. -*C* is recommended in diphtheria, strepto- and staphylococcal infections, Plant–Vincent angina, and foot-and-mouth disease, further as a hæmostiptic especially combined with -*P* (citrin). -*A* + -*D* is recommended in ozæna. Good results in postoperative angina were obtained with -*D* combined with Ca gluconate. C. E.

Action of vitamin-*C* in chronic otitis media. F. Chimani (Mschr. Ohrenheilk., 1939, **73**, 123—139).—18 patients suffering from chronic otitis showing a deficiency of vitamin-*C* improved or were considered cured if, besides the usual treatment, injections of -*C* were given. Experiments proved that the mucous membrane of the middle ear in guinea-pigs can store -*C*. C. E.

Treatment of tinnitus with hypertonic magnesium sulphate. D. Joannovich (Practica otolaryng., 1939, **2**, 114—125).—Buzzing noise in the ears on vasomotor or vascular basis was cured in 50% of the cases by intravenous injection of 5 c.c. of 50% $MgSO_4$ solution. Noises of other ætiology as syphilis, otosclerosis, or otitis media showed good results only exceptionally. C. E.

Acuity of hearing of left- and right-handed children. G. Briggs, D. P. Choyce, J. Hill, and P. M. T. Kerridge (J. Physiol., 1939, **96**, 48—49P).—Out of 2666 children (7—14 years), 180 wrote with their left hand; their hearing acuity is compared with that of 180 right-handed writers. Over half the

children in both groups use their ears equally but about ⅓ of the left-handers use their right ears better than their left, while there is only a small difference between the acuity of right and left ears of right-handed children. J. A. C.

Determination of water pressure as function of labyrinth in fish. GÜTTICH and MÖHRER (Arch. Ohr.-, Nas.-, u. Kehlkheilk., 1939, **146**, 16).—Fishes, especially those living in a const. depth, show a typical reaction if the level of the water is raised or lowered; they release air or come to the surface to take in air. This reaction was not observed if that part of the labyrinth is extirpated which is responsible for hearing. C. E.

Blood-sugar level after labyrinthine stimulation. G. GATTESCHI and T. RODOLFO-MASERA (Arch. ital. Otol., 1939, **51**, 105—129).—The blood-sugar level in normal subjects did not change after caloric or rotatory stimulation of the labyrinth. C. E.

Labyrinthine stimulation and vomiting. F. VENTURA-GREGORINI (Arch. ital. Otol., 1939, **51**, 1—23).—Caloric or galvanic stimulation of the labyrinth in dogs does not change stomach tone. It is assumed that sea-sickness is not due to labyrinthine stimulation. C. E.

Effect of blood-sugar level on vestibular chronaxie. J. HURYNOWICZ and M. RUBINSTEIN (Compt. rend. Soc. Biol., 1939, **131**, 365—368).—Insulin injection in the rabbit produces a fall in the vestibular chronaxie (measured by taking the chronaxie of the reflex lateral inclination of the head, nystagmus and tonic deviation of the eyes). The fall is not parallel with the fall in blood-sugar. A rise in blood-sugar causes a slight rise in vestibular chronaxie. P. C. W.

Effect of calcium, potassium, and magnesium on vestibular excitability. J. HURYNOWICZ and M. RUBINSTEIN (Compt. rend. Soc. Biol., 1939, **131**, 368—370).—A rise in blood-Ca causes a rise in vestibular excitability in the rabbit. A fall has the opposite effect. These effects of Ca are antagonised by Mg and K. P. C. W.

Vestibular excitability in experimental anæmia. M. RUBINSTEIN and J. HURYNOWICZ (Compt. rend. Soc. Biol., 1939, **131**, 357—360).—The vestibular chronaxie is diminished during the anæmia following hæmorrhage in the rabbit. The fall is not proportional to the degree of anæmia. P. C. W.

(xi) DUCTLESS GLANDS, EXCLUDING GONADS.

Fœtal production of hormones. H. WINKLER and A. BINDER (Klin. Woch., 1939, **18**, 816—818).—Ascorbic acid is present in the pituitary, ovary, and adrenal of fœtuses of 29—40 cm. length. E. M. J.

Modifiability of growth by endocrine substances. B. WEBSTER (J. Pediat., 1939, **14**, 684—690).—A crit. review. C. J. C. B.

Heteroplastic transplantation of the hypophysis between different species of *Amblystoma*. R. F. BLOUNT (Proc. Soc. Exp. Biol. Med., 1939, **40**, 212—214).—Implantation of *A. tigrinum* pituitary into the axolotl (*A. mexicanum*) causes increased pigmentation with decreased growth, and brings about metamorphosis. V. J. W.

Investigation of induced hyperglycæmia in tumours of the hypophysis. COSSA, AUGIER, and RIVOIRE (Rev. Neurol., 1939, **71**, 267—279).—Modifications of the curve of induced hyperglycæmia towards a normal type in 6 cases of anterior pituitary dysfunction were brought about by radiotherapy. Different types of curve are obtainable in adenomata of the hypophysis. W. K. S.

Implantation of pituitary glands into larvæ of various species of triton. I. Effect on sex organs. W. HERRE and F. RAWIEL (Roux' Arch., 1939, **139**, 86—109).—The development of the external sex character is accelerated after the implantation of adult pituitary glands. The testes of young *Triturus cristatus danubialis* showed spermatogenesis, though sometimes abnormal. The ovaries seem to remain unchanged. The germ cells in the ovaries of *T. marmoratus* reach a higher stage of maturation than in the control animals. In *T. helveticus* the gonads of the ♂♂ and ♀♀ are further developed than normally. W. J.

Action of anterior pituitary extracts on rabbits. S. SAYAMA (Folia endocrinol. japon., 1939, **14**, 81—82).—Anterior pituitary extracts were injected daily for 5 days; the body-wt. falls, pulse and respiration rate increase, blood pressure falls. The rabbits react more markedly to adrenaline, but not to pilocarpine, acetylcholine, or pituitrin. E. R.

Gonadotrophin from horse pituitaries. P. EGGLETON and J. M. ROBSON (J. Physiol., 1939, **96**, 4—5P).—Attempts to isolate from acetone-dried horse pituitary material two qualitatively different gonadotropic preps after the manner of Fevold have failed. A gonadotropic material of "mixed" activity, *i.e.*, producing follicular growth, ovulation, and luteinisation, has been obtained; it contains ⅓ the activity of the original dried gland, conc. into about $\frac{1}{150}$ of its bulk. It is sol. in all degrees of acidity and alkalinity, and is not toxic to man when injected intravenously. J. A. C.

Chemical fractionation of gonadotropic factors present in sheep pituitary. H. JENSEN, M. E. SIMPSON, S. TOLKSDORF, and H. M. EVANS (Endocrinol., 1939, **25**, 57—62).—The 40% alcohol extract of dried pituitary is dried and extracted with dil. acetic acid. Details are given for separation of two hormones, depending on pptn. by half-saturated $(NH_4)_2SO_4$ of an interstitial cell-stimulating hormone, and by 80% saturated $(NH_4)_2SO_4$ of a follicle-stimulating hormone. The purified products have respectively 80 and 100 times the potency of the dried gland. V. J. W.

Rate of increase in hypophyseal gonadotropic content following ovariectomy in the rat, with observations on gland weights. H. D. LAUSON, J. B. GOLDEN, and E. L. SEVRINGHAUS (Endocrinol., 1939, **25**, 47—51).—Hypophyses of 24-week old rats, which had been spayed 5—120 days previously, con-

tained 3·7—51·9 times as much gonad-stimulating hormone as controls. V. J. W.

Gonadotropic action of anterior pituitary extract after tryptic digestion. G. CHEN and H. B. VAN DYKE (Proc. Soc. Exp. Biol. Med., 1939, **40**, 172—176).—Tryptic digestion destroys most of the luteinising power of extracts of sheep or horse pituitary. V. J. W.

Antigonadotropic factor. Quantitative aspects of the prolan-antiprolan reaction. B. ZONDEK, F. SULMAN, and A. HOCHMAN (Proc. Soc. Exp. Biol. Med., 1939, **40**, 96—98).—Prolan and antiprolan neutralise each other quantitatively independently of which is placed in the test-tube first and of whether the quantities used are added all at once or in portions at intervals. V. J. W.

Relation of the intact pituitary gland to artificially induced ovulation. R. RUGH (Proc. Soc. Exp. Biol. Med., 1939, **40**, 132—136).—Normal hibernating frogs can be made to ovulate by injection of 3—4 frogs' pituitaries. Hypophysectomised frogs ovulate on injection of one pituitary. V. J. W.

Progonadotropic augmentary immune sera after protracted injection of hypophyseal gonadotropic hormone in rabbits. F. SULMAN and A. HOCHMAN (Proc. Soc. Exp. Biol. Med., 1939, **40**, 98—100).—One rabbit which was injected daily for 5 months with extract of rat pituitary developed a progonadotropic factor so that 0·025 c.c. of its serum increased eightfold the gonadotropic effect of rat's pituitary extract given at the same time. V. J. W.

Histopathology of the pituitary of the white rat injected with follicular hormone. A. WEIL and B. ZONDEK (Endocrinol., 1939, **25**, 114—122).—Prolonged injections of œstradiol benzoate, totalling 780,000 mouse units in a year, caused increase in size of the pituitary with degenerative changes in all the cells and occasional hæmorrhages. V. J. W.

Method of determining diabetogenic hormone in urine. H. KJEMS and T. BJERING (Acta med. scand., 1939, **99**, 492—493).—A method of extracting the hormone from urine is described. The extract is tested by its effect on the blood-sugar after injection into the rabbit. C. A. A.

Anterior pituitary and diabetes. H. BARTELHEIMER (Klin. Woch., 1939, **18**, 647—651).—A review. E. M. J.

Hypophyseal diabetes. H. BARTELHEIMER (Dtsch. Arch. klin. Med., 1939, **184**, 185—199).—Various types of hypophyseal diabetes are distinguished. An acromegalic and a "Cushing" type are described. Administration of follicle hormone in women and of testosterone in men increased the carbohydrate tolerance. A. S.

Effect of insulin on partially hypophysectomised rats. H. D. JONES (Proc. Soc. Exp. Biol. Med., 1939, **40**, 68—70).—A small dose of insulin causes in such rats a rise of blood-sugar, reaching a max. at 2 hr. and gradually returning to normal. There is occasionally a slight fall in blood-sugar in the first 30 min. V. J. W.

Influence of anterior pituitary on protein metabolism. J. A. MIRSKY (Endocrinol., 1939, **25**, 52—56).—Administration of crude alkaline extracts diminished protein breakdown in normal dogs, and increased protein breakdown in depancreatised or eviscerated dogs. The pancreas probably mediates the action of pituitary extract in diminishing protein catabolism. V. J. W.

Body size and energy metabolism in growth hormone rats. M. KLEIBER and H. H. COLE (Amer. J. Physiol., 1939, **125**, 747—760).—Comparison was made between the metabolic rates of female rats made giant by daily injection over 6 months of Evans' growth hormone prep. and those of litter mates. The growth of the skin of the injected rats was relatively greater and that of the liver (relatively less than that of the body as a whole) when compared with the uninjected controls. The thyroids of the injected rats were relatively smaller and their adrenals absolutely smaller than the corresponding glands of the controls. The metabolic rate of the injected rats per unit wt. and per unit surface was consistently and significantly lower than those of the controls. This was found both during and after the period of injections, and cannot be explained by genetic differences. The rate of O_2 consumption per unit dry wt. of tissue *in vitro* was smaller in the diaphragms of the injected rats than in the controls. It is considered that these findings indicate somatic adaptation of tissue metabolism *in vivo* and *in vitro* to the condition of the animal as a whole, particularly to its endocrine system, which is in correlation to body size. M. W. G.

Reaction of thyroid chondriome to thyrotropic hormone. J. MOREL, M. CHRISTIN, and P. J. GINESTE (Ann. Anat. path. méd.-chir., 1939, **16**, 211—212).—In guinea-pigs the chondriome is normally in the form of very small mitochondria scattered throughout the cytoplasm but occasionally localised at the apical pole. The vesicles are large and lined by flattened epithelium. Young animals (160—200 g.) were used and the reaction to "thyrormone Byla," injected subcutaneously, was studied after 6, 12, and 24 hr. In 6 hr. considerable hypertrophy of the vesicular epithelium occurs and numerous vacuoles appear in the colloidal substance. All the mitochondria increase slightly in size and are of various dimensions. In 12—24 hr. they assume large dimensions especially at the apical pole of the cells. Small mitochondria typical of the normal cell are not present. W. F. H.

Immunology of hypophyseal mammotropic preparations. H. W. BISCHOFF and W. R. LYONS (Endocrinol., 1939, **25**, 17—27).—Mammotropic preps. from ox and sheep pituitaries were indistinguishable in anaphylactic tests, Dale and Arthus reactions, precipitin and complement fixation tests, and in neutralisation by antiserum from rabbits immunised with either ox or sheep mammotropin. V. J. W.

Effects of light and darkness on activity of pituitary of rat. V. M. FISKE (Proc. Soc. Exp. Biol. Med., 1939, **40**, 189—191).—Immature rats kept in light reached sexual maturity more quickly

than those in the dark, and their pituitaries were more potent in causing follicular growth than the "dark" rats' pituitaries, which were more potent in causing vesicular growth. V. J. W.

Mechanism of action of melanophore-expanding drugs and its relationship to hypophysis. T. C. R. SHEN (Arch. int. Pharmacodyn., 1939, **62**, 295—329).—Melanophore-expanding substances are pituitotropic or non-pituitotropic. Barbiturates and corynanthine are in the first category. The action of these is not due to motor paralysis, to vasomotor change, or to potentiation of the hormone itself. Like that of local application of anæsthetics, their action is due to increased secretion of melanophore-expanding hormone from the pars intermedia of the hypophysis and is abolished by hypophysectomy. D. T. B.

Influence of light and darkness on melanophore-dilating action of hypophysis. J. N. MASSELIN (Rev. Soc. argent. Biol., 1939, **15**, 28—34).—The hypophysis of toads was extracted in saline and injected subcutaneously into toads; variations in skin colour were observed compared with a control. The glands obtained in winter had stronger melanophore-dilating activity than those obtained in summer. When the animals were kept in the dark the activity of the gland increased after 11—14 days and continued to increase to a max. with longer time of darkness. Strong, permanent illumination and a white background decreased the activity of the gland after 11—14 days. Extirpation of the eye-balls produced the same effect as darkness; a strong light playing on the head of these blind animals diminished the activity of the hypophysis. Electrical stimulation of the optic nerves had the same effect as strong light on the eye. There was no difference in the activity of hypophyseal extracts made with saline, distilled water, and 0·1N-NaOH. The blood from 6 toads, in various conditions of illumination, was injected intravenously into a normal toad in the course of 1 hr., drawing 5 c.c. of blood and injecting the same amount every 10 min. This procedure had no effect on the melanophores. J. T. L.

***In vitro* studies of melanophore-principle activity of pituitary gland.** G. FOSTVEDT (Proc. Soc. Exp. Biol. Med., 1939, **40**, 302—304).—Addition of melanophore-principle to a tyrosine–tyrosinase mixture increased the O_2 uptake by 12—100%, a prep. from the anterior pituitary being the more powerful. The O_2 uptake was diminished when the oxytocic or pressor hormones were added. V. J. W.

Rôle of light in action of drugs on hypophyseal melanophore hormone secretion of frogs (*Rana temporaria*). T. C. R. SHEN (J. Physiol., 1939, **96**, 15—16P).—The drugs tested include 3-piperidinomethylbenzdioxan (F. 933), yohimbine, nicotine, Na phenobarbital, allyl*iso*propylbarbituric acid, Na barbital, and chloralosane. Neither total darkness nor prolonged continuous light has any appreciable influence on the stimulating action of drugs examined on the hypophyseal melanophore hormone secretion of frogs. J. A. C.

Relation of hypophysis to spleen. III. Hypophysectomy and resistance to *Trypanosoma lewisi*. D. PERLA (Proc. Soc. Exp. Biol. Med., 1939, **40**, 91—94).—In hypophysectomised rats the infection was more severe and lasted 50% longer. Resistance was restored to normal by alkaline anterior pituitary extract. V. J. W.

Vagus–post-pituitary reflex. VI. Phenomena of exhaustion and recuperation. H. C. CHANG, J. J. HUANG, R. K. S. LIM, and K. J. WANG (Chinese J. Physiol., 1939, **14**, 1—8).—The central end of the vagus to the isolated dog's head, prepared as described in A., 1939, III, 376, was stimulated at intervals for 4—20 hr., and the pressor responses were matched against pitressin. When the response had disappeared, none could be obtained on stimulating the supraoptic region or the pituitary and no granules were present in the pituicytes stained by Penfield's method; after a 2 hr. rest, response and granules reappeared. N. H.

Excretion of urinary dyes in diabetes insipidus. G. KABELITZ (Klin. Woch., 1939, **18**, 849—850).—The daily excretion of urinary dyes in a case of diabetes insipidus was reduced to ⅓; no urobilin or urobilinogen was found but porphyrin excretion was raised. Injection of pituigan raised the excretion to normal vals.; hypophysin or orasthin had no influence. E. M. J.

Influence of water, saline, and novasurol on hormone content of posterior pituitary in rats. G. KUSCHINSKY and P. LIEBERT (Klin. Woch., 1939, **18**, 823).—Posterior pituitary lobes of normal rats contained 0·9 Vögtlin unit per mg. of antidiuretic and 0·4—0·5 unit of uterus-active substance. The content in both falls by half after large doses of saline. The antidiuretic substance was increased 24 hr. after a large dose of water alone or with simultaneous injection of novasurol and lowered after intravenous injection of novasurol alone. E. M. J.

Action of posterior pituitary extract depots in diabetes insipidus. R. WANKMÜLLER (Klin. Woch., 1939, **18**, 566—568).—Intramuscular depots of posterior pituitary extract, containing 24—36 units, relieved cases of diabetes insipidus for 3—5 days and have been used for over 3 years. They allow a 50—80% more economical use of the hormone than other forms of administration. E. M. J.

Diuretic substance in posterior pituitary extracts. G. KUSCHINSKY and H. E. BUNDSCHUH (Arch. exp. Path. Pharm., 1939, **192**, 683—700; cf. A., 1939, III, 578).—The diuretic effect of orasthin cannot be due to admixture of small amounts of vasopressin. H. BL.

Apparent augmentation of pituitary antidiuretic action by various retarding substances. R. L. NOBLE, H. RINDERKNECHT, and P. C. WILLIAMS (J. Physiol., 1939, **96**, 293—301).—Various cations, anions, and org. substances, when added to posterior pituitary extract, prolong the antidiuresis obtained by subcutaneous injection; the most active are Zn, Ni, Ca, and ferrocyanide. When posterior pituitary principles are extracted from blood and urine and tested by antidiuretic assay, an apparently greater

than 100% recovery is obtained owing to the presence of augmenting substances. Similarly the addition of such augmenting substances makes it possible to increase the sensitivity of the qual. test for anti-diuretic hormone. The augmentation is due to delayed absorption from the injection site. A method of extracting posterior pituitary principles from large vols. of urine is described. J. A. C.

New method for assay of posterior pituitary extracts. J. M. Coon (Arch. int. Pharmacodyn., 1939, **62**, 79—99).—The depressor response of the White Leghorn fowl is used as biological assay test of posterior pituitary extracts. The chicken is tolerant of repeated small doses. When the pressor–oxytocic ratio is above 2·5 the val. obtained by this method is higher than that revealed by the guinea-pig uterus. In all other samples the results agree. The discrepancy is not due to action on the myocardium of the pressor substance. Atropine augments the fall and succeeding rise of pressure caused by the extracts. The validity of the uterus method when pressor–oxytocic ratio is high is questioned. D. T. B.

Assay of pineal extracts. P. Engel (Endocrinol., 1939, **25**, 144—145).—Extracts can be assayed by determining the quantity necessary to prevent vaginal opening in 22-day old mice. Less pure extracts also contain a substance which has a synergistic effect with gonadotropic hormone. V. J. W.

Pleomorphous cell lymphosarcoma of thymus. J. L. Rogatz (J. Pediat., 1939, **14**, 618—631).—A case of pleomorphous cell lymphosarcoma of the thymus in a female infant aged 2½ months is reported, with autopsy findings. (B.) C. J. C. B.

Weight of thyroid gland in Switzerland. A. Ostwald and W. Risch (Münch. med. Wschr., 1939, **86**, 996—997).—A table is given showing the average wt. of the human thyroid gland in various Swiss towns. A. S.

Distribution of goitre in Hungary and its relation to the radioactivity of soil and drinking water. J. Straub and T. Török (Z. Hyg., 1938, **121**, 182—184).—No relation is apparent between incidence of goitre and radioactivity of the soil and water in Hungary. Incidence of goitre is always associated with low, and absence of goitre with high, I content of the water. M. A. B.

Endemic goitre in Manchukuo and its relation to iodine of soil. K. Noda (Folia endocrinol. japon., 1939, **14**, 73—79).—150 samples of soil of Manchukuo were examined. The incidence of goitre is inversely proportional to the amount of I in the soil. Soil derived from older geological formation contains less I than that derived from newer formations. E. R.

Anatomico-physiological classification of goitres. A. Debeyre and P. J. Gineste (Ann. Anat. path. méd.-chir., 1939, **16**, 267—282).—The following classification of goitres based on the authors' conception of a three-stage functional cycle of the thyroid cell is presented: (1) stage of rest or interphase; (2) stage of accumulation; (3) stage of resorption. These stages are correlated with fœtal thyroid adenomata, colloid and cystic goitre, and thyroid atrophy respectively. W. F. H.

Rôle of cervical sympathetics in regulation of thyroid and thyrotropic function. U. U. Uotila (Endocrinol., 1939, **25**, 63—70).—The decrease in size of the cells of the thyroid caused by hypophysectomy in rats is not modified by removal of the cervical sympathetics or by exposure to cold with the sympathetic intact. V. J. W.

Chronic thyrotoxic myopathy. F. B. Parsons and R. J. Twort (Lancet, 1939, **236**, 1379—1381).—A case of chronic myopathy was relieved by thyroidectomy. Histological examination of the thyroid showed very active epithelial hyperplasia and papillary ingrowths. C. A. K.

Influence of thyroid hormone on serum-phosphatase. N. B. Talbot (Endocrinol., 1939, **24**, 872—873).—Hypothyroid children have a low serum-phosphatase, which can be raised to normal by thyroid treatment. V. J. W.

Effect of ingestion of thyroid gland on rate of oxidation of alcohol in white rats. L. Dontcheff (Compt. rend. Soc. Biol., 1939, **130**, 1410—1412).—The rate of oxidation of alcohol is decreased in fasting rats by ingestion of thyroid gland. This effect may be partly neutralised by the addition of excess of vitamin-B_2. H. G. R.

Stimulating action on metabolism and heart beat of various thyroid preparations in the thyroidectomised rat. A. E. Meyer and M. Yost (Endocrinol., 1939, **24**, 806—813).—Thyroxine or thyroid globulin increase metabolism much more than heart rate. Dried thyroid increases heart rate more than metabolism, and products of thyroid globulin hydrolysis increase heart rate and may leave metabolism unaffected. V. J. W.

Thyroid changes produced by nicotine. I. Inoue (Folia endocrinol. japon., 1939, **14**, 79—81).—Prolonged injection of nicotine causes first a diminution in the size of the thyroid vesicle, epithelial hyperplasia, and vasodilatation. Later the vesicles swell, their contents become more conc., the epithelium becomes small or degenerate, and the vessels constrict. Partly thyroidectomised animals respond to smaller doses than normal animals. Normal thyroid glands develop a resistance to nicotine; this does not occur in partially thyroidectomised animals in which the remains of the thyroid are finally destroyed. E. R.

[Action of] bromine [on thyroid]. G. Moruzzi (Boll. Soc. ital. Biol. sperim., 1939, **14**, 200—202).—In dogs ingesting 0·25 g. of NaBr per kg. per day, the Br content of the thyroid gland increases from 0·422 mg. (normal level) to 200 mg. per 100 g. of fresh tissue for the first 30 days; during this period, the thyroid-I remains const. With continued ingestion, the Br content subsequently steadily decreases (*e.g.*, to 9·54 mg. per 100 g. after 180 days) and the I content simultaneously diminishes (*e.g.*, to 6% of its normal val. after 300 days); the latter is accompanied by a fall in basal metabolic rate. F. O. H.

Action of thymol on thyroid gland. H. MÖLLER (Arch. exp. Path. Pharm., 1939, **191**, 615—620).—Prolonged administration of thymol to guinea-pigs produced signs of activation in the thyroid gland without causing an increase in O_2 consumption. H. O. S.

Abdominal distension; manifestation of possible thyroid insufficiency in children. G. B. DORFF and B. STOLOFF (Arch. Pediat., 1939, **56**, 291—303).—2 cases are described which responded rapidly to thyroid medication. C. J. C. B.

Endocrine implication of juvenile chondro-epiphysitis. R. L. SCHAEFER, F. L. STRICKROOT, and F. H. PURCELL (J. Amer. Med. Assoc., 1939, **112**, 1917—1919).—In a group of 258 endocrinopathic patients of 8—15 years of age 91 showed evidence of chondro-epiphysitis. 85 of the 91 cases showed evidence of hypothyroidism. It is concluded that chondro-epiphysitis is a pathognomonic sign of hypothyroidism. R. L. N.

Development and behaviour of thyroidectomised young rooks. G. A. VASSILIEV and A. A. VOITKEVITSCH (Compt. rend. Acad. Sci. U.R.S.S., 1939, **22**, 374—379).—Thyroidectomy in young rooks impairs general growth and differentiation of plumage. The earlier is the age of operation, the greater is the impairment of growth. W. F. F.

Myxœdema heart. E. R. MARZULLO and S. FRANCO (Amer. Heart J., 1939, **17**, 368—374).—A case of myxœdema had a typical "myxœdema heart" with multiple serous effusions not due to heart failure. C. A. K.

Hyperparathyroidism produced by diet. E. J. BAUMANN and D. B. SPRINSON (Amer. J. Physiol., 1939, **125**, 741—746).—Feeding a low-Ca and high P-diet (carrots and oats) to rabbits for several months causes enlargement of the parathyroids to 2 or more times their normal size (on stock diet wt. 10—15 mg., on carrots and oats 30—50 mg.), and hypertrophy of the cells and nuclei with an increase in the amount of lipins in the cytoplasm. Serum-Ca (Clark and Collip method) and -P are low but within normal range; serum-phosphatase (Bodansky method) is less than normal. Increased vascularity but no other change is found in the bones. Frequent Hamilton and Schwartz tests on rabbits fed this diet always indicated an abnormally large amount of circulating parathyroid hormone. M. W. G.

Postoperative parathyroid tetany. H. H. MARGOLIS and G. KRAUSE (J. Amer. Med. Assoc., 1939, **112**, 1131—1133).—In a case of postoperative parathyroid tetany dihydrotachysterol was the most effective therapeutic agent. R. L. N.

Familial occurrence of tetany. A. PROHASKA (Wien. klin. Wschr., 1939, **52**, 623—624).—2 sisters suffered from severe tetany caused by parathyroid insufficiency; they were successfully treated with prep. AT. 10 (dihydrotachysterol). A. S.

Parathyroid mitoses with large doses of vitamin-*D*. G. CARRIÈRE, J. MOREL, and P. J. GINESTE (Ann. Anat. path. méd.-chir., 1939, **16**, 209—211).—Active parathyroid karyokinesis follows the administration of large doses of vitamin-*D* to young rabbits. The mechanism governing the elimination of Ca from the body is upset. It appears that this stimulation is a secondary phenomenon to either over-fixation of Ca in the skeleton or its accumulation in the organism. A similar histo-physiologic activity could not be demonstrated in young or old rats. W. F. H.

Chemical assay of insulin. H. JENSEN (Nature, 1939, **143**, 686).—Since I reacts with certain groupings not confined solely to the insulin mol., it is doubtful whether the physiological potency of insulin preps. can be determined iodometrically (cf. A., 1939, III, 477). L. S. T.

p_H of cerebral cortex and arterial blood under insulin. C. MARSHALL, W. S. MCCULLOCH, and L. F. NIMS (Amer. J. Physiol., 1939, **125**, 680—682).—1—1½ hr. after intravenous injection of insulin into curarised animals (monkey, 100 clinical units; dog, 300 units), under const. artificial respiration, fluctuations of the p_H of the cortex appear without corresponding fluctuations of p_H of arterial blood. Intravenous injection of buffered glucose solution lowers the p_H of arterial blood and cortex and stops the recurrent fluctuations of the cortex p_H. M. W. G.

Insulin and alimentary hyperglycæmia in young normal subjects. H. P. HIMSWORTH and R. B. KERR (Clin. Sci., 1939, **4**, 1—17).—In 4 normals the general relationship between insulin dosage and the degree to which it suppresses alimentary hyperglycæmia can be expressed as a curve. The effect of a standard dose of insulin depends on the composition of the diet, and varies directly with the degree of alimentary hyperglycæmia on which it acts. B. McA.

Blood-catalase and insulin. L. MIGONE and T. SANGUINETI (Biochim. Terap. sperim., 1939, **26**, 24—34).—The catalase of blood is the same in normal and diabetic subjects and is not modified by insulin. S. O.

Clinical experiences with new Nativ-insulin depot. F. UMBER, F. K. STÖRRING, and G. ENGELMANN (Klin. Wœch., 1939, **18**, 837—839).—The new Nativ-insulin prepared from fresh calf pancreas is claimed to contain only 15 μg. of dry substance per unit. This insulin fraction is depot effective without addition of body foreign substances, but $MgCl_2$ prolongs the action further. Only ⅔ of the dosage of old insulin is needed (240 cases). E. M. J.

Administration of insulin in diabetics with angina pectoris. G. BICKEL (Schweiz. med. Wschr., 1939, **69**, 520—521).—Life expectation of diabetic patients with angina pectoris, properly treated with insulin, is several years, as compared with one year in untreated cases. A. S.

Effect of stellate ganglionectomy on carbohydrate metabolism and on hypoglycæmic convulsions caused by administration of insulin. W. C. CORWIN (Proc. Staff Mayo Clin., 1939, **14**, 374—376).—In 6 dogs bilateral stellate ganglionectomy did not prevent convulsions following insulin administration and fasting blood-sugar vals., glucose

tolerance curves, and blood-sugar curves following insulin administration were unaffected. A. M. G.

Delayed insulin absorption in children with circulatory disorders. H. HUNGERLAND (Klin. Woch., 1939, **18**, 646).—Insulin action is the same when injected subcutaneously above the ankle in normal children sitting up or lying down; the fall of blood-sugar is, however, slow and small when insulin is injected in the sitting child with circulatory disease or suffering from vasolability or orthostatic collapse; the fall is normal in both groups when lying down. E. M. J.

Action of liver extract on insulin hypoglycæmia. H. HUNGERLAND (Klin. Woch., 1939, **18**, 647).—Premedication with hepatopsan (daily injection of 2 c.c. for 4—7 weeks) changed the insulin response in rabbits; the blood-sugar falls more quickly after injection, and then rises in 2 hr. considerably above the resting val. E. M. J.

Relationship of hyperglycæmic principle in diabetic urine to pancreas and hypophysis. H. L. CLAY and H. LAWSON (Amer. J. Physiol., 1939, **125**, 566—570).—Treatment of human diabetic urine with kaolin (5 g. to 500 c.c.) yields an adsorbate which can be eluted with 60% alcohol. The adsorbed material produces hyperglycæmia when injected intravenously in rabbits. A similar or identical hyperglycæmic principle can be demonstrated in the urine of depancreatised dogs. Control of the diabetic syndrome with insulin does not remove the hyperglycæmic principle. Hypophysectomy prevents the appearance of the principle in the urine of depancreatised dogs; pancreatectomy of hypophysectomised dogs is not followed by the appearance of the hyperglycæmic agent. M. W. G.

Decrease in blood-sugar in rabbits under the influence of insulin during different months of the year. R. W. SPANHOFF (Pharm. Weekblad, 1939, **76**, 754—760).—Statistical data on 5241 rabbits shows that the decrease in the blood-sugar level caused by insulin is subject to seasonal variations. The sensitivity is highest in June—October (max. Aug. and Sept.) and lowest November—May (min. Feb.). Variations do not coincide with variations in temp. or pressure, but some relationship with humidity exists. The most favourable dosage of standard insulin in standardisation tests is lower from June to October than from December to May. S. C.

Paradoxical behaviour of blood-sugar level during insulin treatment. S. LUPS (Klin. Woch., 1939, **18**, 813—816).—3 cases of schizophrenia passed into deeper coma (which was unrelieved by adrenaline) after oral administration of glucose during insulin shock treatment; they were roused by intravenous injection of glucose. E. M. J.

Chronic hypoglycæmia; two cases with islet adenoma and changes in the hypophysis. N. B. FRIEDMAN (Arch. Path., 1939, **27**, 994—1010).—Two cases of chronic hypoglycæmia are reported, in each of which an islet adenoma of the pancreas was found post mortem. In both cases there was hyperplasia of the basophil and eosinophil cells of the pituitary. (6 photomicrographs.) C. J. C. B.

Death from insulin-shock therapy. H. JACOB (Nervenarzt, 1939, **12**, 302—308).—Animal experiments and human pathological studies suggest that vascular changes (hæmorrhages etc.) in deaths from insulin coma are caused by the convulsions and not directly by insulin. C. A. K.

Clinical experience with globin insulin. L. BAUMAN (Proc. Soc. Exp. Biol. Med., 1939, **40**, 170—171).—One dose daily was sufficient for moderately severe cases and no undesirable effects were observed. V. J. W.

Insulin preparations with prolonged activity. I. Globin insulin. L. REINER, D. S. SEARLE, and E. H. LANG (Proc. Soc. Exp. Biol. Med., 1939, **40**, 171).—Globin insulin produces a hypoglycæmia which is not so prolonged as that after protamine–Zn–insulin, but is quicker in onset. V. J. W.

Present status of protamine–insulin. H. LANDE (Bull. N.Y. Acad. Med., 1939, **15**, 273—281).

Hypoglycæmic action of insulin precipitated with zinc hydroxide. E. AUBERTIN, L. SERVANTIE, and C. CHASSAGNETTE (Compt. rend. Soc. Biol., 1939, **130**, 484—488).—The optimal concn. of Zn for prolonging the hypoglycæmic action of insulin in the rabbit is 6 μg. per unit and in the dog 8 μg. per unit. The Zn is more effective when given in the form of pptd. $Zn(OH)_2$ or $ZnCO_3$ than when given in solution. The suspension adsorbs all the insulin and even prolongs the hypoglycæmia when injected intravenously. P. C. W.

Results of treatment with depot insulins. H. BERNING (Dtsch. Z. VerdauKr. Stoffw., 1939, **2**, 22—29). E. M. J.

Why diabetics discontinue protamine–insulin. R. WILDER (Amer. J. med. Sci., 1939, **197**, 557—559).—From the results of treatment with protamine–insulin, in the first 1250 patients treated it was concluded that the no. who cannot use protamine–Zn–insulin successfully and to great advantage is less than 5%. R. L. N.

Successful treatment of diabetic girls with protamine–zinc–insulin. P. WHITE and L. WINTERBOTTOM (J. Amer. Med. Assoc., 1939, **112**, 1440—1441). R. L. N.

Recent advances in diabetes mellitus treatment. V. JONÁŠ (Schweiz. med. Wschr., 1939, **69**, 598—601).—The advantages of protamine–Zn–insulin treatment of diabetes mellitus are discussed. A. S.

Experiences with depot insulin. A. HERZOG and H. HÖRNISCH (Med. Klin., 1939, **35**, 908—912).—The efficacy of protamine–insulin and protamine–Zn–insulin decreases on prolonged administration. This is attributed to gradually increasing proteolytic processes in the organism. A. S.

Prolonged treatment of depancreatised dog with protamine–zinc–insulin. L. HÉDON, A. LOUBATIÈRES, and G. HEYMANN (Compt. rend. Soc. Biol., 1939, **130**, 997—999).—Dogs can be maintained in good condition for at least 2 months following pancreatectomy by a single daily injection of protamine–Zn–insulin. P. C. W.

Advantages of protamine–zinc–insulin therapy. H. Pollack and H. Dolger (Ann. int. Med., 1939, **12**, 2010—2021).—Clinical advantages of protamine Zn–insulin are discussed. C. A. K.

Protamine–zinc–insulin in diabetes. R. D. Lawrence (Brit. Med. J., 1939, I, 1077—1080).—The treatment of diabetes by one daily injection of protamine–Zn–insulin is described in detail. C. A. K.

Nickel "insulinate."—See A., 1939, II, 397.

Determination of adrenaline by new colorimetric technique. "Virtual" adrenaline. A. Vinet (Bull. Soc. Chim. biol., 1939, **21**, 678—688).—A modification of the method of Bailly (A., 1925, ii, 248) is used, the determination being made by means of an electrophotometer with an error of 3%. The adrenaline contents of the two glands from the same animal differ considerably, and there is no evidence of the formation of additional adrenaline after the glands have been kept for 24 hr. at 0°. A. L.

Effect of sympatholytic substances on enzymic transformation of adrenaline into a hypotensive substance. G. Ungar and J. L. Parrot (Compt. rend. Soc. Biol., 1939, **131**, 62—64).—Sympatholytic substances (883 F., 933 F., and corynanthine) increase the formation of a hypotensive substance from adrenaline by stomach tissue. H. G. R.

Effects of continued, intravenous injection of adrenaline. H. Hermann, F. Jourdan, G. Morin, and J. Vial (Compt. rend. Soc. Biol., 1939, **130**, 952—954).—Continuous, intravenous injection of adrenaline into the chloralosed, vagotomised dog does not produce a steady hypertension; after an initial rise, the pressure falls slowly to its original val. The loss of vasoconstriction applies to the whole peripheral area. Cessation of the injection causes an immediate hypotension. P. C. W.

Sensitisation and accomodation to adrenaline. D. Danielopolu and I. Marcu (Compt. rend. Soc. Biol., 1939, **130**, 1112—1115).—Intra-arterial injection of adrenaline (10 μg.) in the femoral artery of the chloralosed, adrenalectomised dog or cat produces the same vasoconstriction in the paw vessels if the injections are given every 5—10 min. If the injections are given every 1—2 min. the effect is increased for the first few injections until a max. effect is attained. If the interval is less (30 sec.) the succeeding effects get less until no reaction is obtained. P. C. W.

Adrenaline secretion after *X*-irradiation of the adrenal glands. H. Seyfried and G. Wachner (Wien. klin. Wschr., 1939, **52**, 619—621).—Blood-sugar determinations over 24-hr. periods were made to gauge the efficacy of *X*-irradiation of the adrenal glands. There was no relationship between strength of radiation and blood-sugar changes in patients suffering from arterial hypertension, angina pectoris, and diabetes mellitus. A. S.

Hemiplegia following injection of epinephrine hydrochloride. E. L. Keeney (J. Amer. Med. Assoc., 1939, **112**, 2131—2132).—A complete right-sided hemiplegia occurred in a young man without hypertension, following an injection of 0·5 c.c. of a 0·1% solution of epinephrine hydrochloride. R. L. N.

Effect of adrenaline on potassium in plasma. J. A. Moglia (Rev. Soc. argent. Biol., 1939, **15**, 5—11).—In chloralosed dogs adrenaline was injected intravenously at a const. rate during 15 min. A dose of 50 μg. per kg. per min. produced an initial increase in plasma-K lasting 5—10 min., followed by a prolonged decrease. Doses of 5 and 2·5 μg. produced a prolonged decrease without the initial increase. The larger doses are similar to the amounts secreted by the adrenals in states of emergency, the smaller ones to the "physiological" amounts of adrenaline and sympathin. J. T. L.

Peroxide content of acetaldehyde and inactivation of adrenaline. T. Wense (Arch. exp. Path. Pharm., 1939, **191**, 358—361).—Inactivation of adrenaline by acetaldehyde is due to peroxides which form on keeping. H. O. S.

Effect of inactivated adrenaline on chromatophores of teleost fish (*Scardinius erithrophtalmus*). B. Uggeri (Biochim. Terap. sperim., 1939, **26**, 3—5).—Adrenaline contracts the chromatophores but expands them if inactivated by formaldehyde. S. O.

Adrenaline and the metabolism of peripheral tissues. L. Cammer and F. R. Griffith, jun. (Amer. J. Physiol., 1939, **125**, 699—706).—The effect of intra-arterial administration of adrenaline on blood flow and respiratory exchange was studied on the resting, intact hind leg of the cat, anæsthetised with chloralose, 0·1 g. per kg. subcutaneously. Adrenaline was administered in concns. of 0·002 mg., 400, 2, and 0·2 μg. per kg. per min. Each experiment consisted of taking 4 arterial-venous pairs of samples at 10-min. intervals. The 3 higher rates of injection all significantly decreased both blood flow and O_2 utilisation in almost parallel degree. Adrenaline had a more diverse and complex effect on CO_2 output, which was, however, increased in all cases. M. W. G.

Deoxycorticosterone. G. W. Thorn and H. Eisenberg (Endocrinol., 1939, **25**, 39—46).—Adrenalectomised dogs of 10 kg. can be maintained in normal health on a low-Na and -Cl diet by daily injections of 1—1·5 mg. of this synthetic product as acetate. V. J. W.

Ponceau–fuchsin stain for androgenic adrenal cortical cells. T. F. Fujiwara (Arch. Path., 1939, **27**, 1030—1031).—A modified technique is described. C. J. C. B.

Action of adrenal cortex tumour extracts on œstrus of rats. W. Rosset (Z. Geburtsh. Gynäk., 1939, **118**, 273—284).—Alcohol extracts were made from a malignant adenoma of the adrenal cortex of a woman suffering from masculinisation and amenorrhœa. They had no action, on injection into rats, on the sexual cycle. S. Sch.

Cholesterol content of fœtal adrenals. N. Neymann (Arch. Gynäk., 1939, **168**, 79—83).—The cholesterol content of the adrenals does not change during the second half of pregnancy, the normal content being about 224 mg.-% free and 298 mg.-%

bound cholesterol. It is not known whether the adrenals produce or merely store cholesterol. S. Sch.

Action of phosphorylised sugar in adrenalectomised animals. W. Laves (Klin. Woch., 1939, **18**, 724).—Oral or subcutaneous administration of 2·5 g. of glucose caused death in adrenalectomised rats; this was preventable by giving adrenal hormone and in some cases by doses of cysteine. Glucose-phosphoric acid was tolerated in doses of 0·5 g. by these animals, but subcutaneous injection of fructose phosphate caused death unless adrenal hormone was given. E. M. J.

Rôle of capsule in suprarenal regeneration studied with aid of colchicine. D. D. Baker and R. N. Baillif (Proc. Soc. Exp. Biol. Med., 1939, **40**, 117—121).—Cortical cells are regenerated from the capsule of enucleated glands. Colchicine was used to increase the no. of mitoses visible. In 4 specimens nerve fibres could be traced through the capsule to the medulla. V. J. W.

Technique of quantitative anatomical investigations of adrenals. G. Bengtsson, K. Melin, and T. Petrén (Morph. Jb., 1939, **83**, 277—286). W. J.

Blood volume of adrenal cortex of trained guinea-pigs. G. Bengtsson, K. Melin, and T. Petrén (Morph. Jb., 1939, **83**, 287—294).—The no. of blood capillaries and the vol. of blood are increased in the adrenal cortex of guinea-pigs after prolonged training. W. J.

Progesterone will maintain adrenalectomised rats. R. R. Greene, J. A. Wells, and A. C. Ivy (Proc. Soc. Exp. Biol. Med., 1939, **40**, 83—86).—40-g. rats were given 4 mg. daily of progesterone for 15 days after adrenalectomy and lived for 16—23 days. Controls lived 3—7 days. V. J. W.

Influenza virus and adrenal gland. F. de Ritis and G. Stolfi (Boll. Soc. ital. Biol. sperim., 1939, **14**, 116—118).—In rats infected by administered influenza virus, the relative vols. of adrenal medulla and cortex decrease and increase, respectively. F. O. H.

Action of adrenal cortex on the lipin curve in Addison's disease. E. Westerlund (Klin. Woch., 1939, **18**, 856—858).—Single or protracted treatment with adrenal cortex hormone of a case of Addison's disease accompanied by steatorrhœa but with a normal blood-sugar curve, raised the serum-lipin curve after ingestion of 100 g. of olive oil from low normal to vals. at the upper limit of normal. The steatorrhœa was diminished at the same time. E. M. J.

Treatment of Addison's disease with adrenal cortex extract. W. O. Thompson, P. K. Thompson, S. G. Taylor III, and W. S. Hoffman (Endocrinol., 1939, **24**, 774—797).—4 out of 7 patients are being maintained in health by daily injection of 10—20 c.c. of a Wilson cortical extract of which 1 c.c. represents 75 g. of ox adrenal, together with 12 g. of NaCl and 4 g. of $NaHCO_3$ or Na citrate by mouth. V. J. W.

Paranoid psychosis with adrenogenital virilism. C. Allen (Brit. Med. J., 1939, I, 1220—1224).—A woman, aged 34, with adrenogenital virilism and paranoid psychosis, was successfully treated by adrenalectomy. C. A. K.

(xii) REPRODUCTION.

Intersexuality. R. C. Moehlig and N. M. Allen (J. Amer. Med. Assoc., 1939, **112**, 1938—1939).—A case is reported. R. L. N.

Effect of saline solutions on development of eggs of *Amblystoma*. G. Andreassi (Boll. Soc. ital. Biol. sperim., 1939, **14**, 195—198).—The effects of 1% aq. NaCl on the development of the eggs of *A. mexicanum* are described and discussed. F. O. H.

Iron in fertilised hen's egg and embryo. C. Lenti (Arch. Sci. biol., Napoli, 1939, **25**, 1—6).—In the yolk all the Fe is in ionic form; in the egg-white it is all combined with protein. The formation of Fe compounds in the embryo was studied quantitatively during 19 days of incubation. R. S. Cr.

Sex substance of sea-urchin. M. Hartmann, O. Schartau, R. Kuhn, and K. Wallenfels (Naturwiss., 1939, **27**, 433).—The material liberated in sea-water by the ripe eggs of *Arbacia pustulosa* contains (*a*) echinochrome (Lederer and Glaser, A., 1938, II, 448) which activates and attracts (chemotaxis) the spermatozoa at dilutions not below $1:2 \times 10^{10}$, and (*b*) a substance which agglutinates the spermatozoa. Echinochrome is a naphthoquinone pigment containing 2 H less than its leuco-compound 1 : 2 : 3 : 4 : 5 : 6 : 8-heptahydroxy-7-ethylnaphthalene. The unripe eggs contain echinochrome but not the agglutinating substance. W. McC.

Spectrography of œstradiol. J. Slosse and N. I. Joukowsky (Compt. rend. Soc. Biol., 1939, **130**, 822—824).—Variations in the ultra-violet spectra of commercial samples of œstradiol are observed in which either one or both of bands at 2804 and 3440 A. occurs. Extraction of the substance from physiological saline with ether causes modification in the spectrum and an ethereal solution of cryst. œstradiol exhibits a band at 2923 A. H. G. R.

Treatment of vulvovaginitis with œstrogen. C. Mazer and F. R. Shechter (J. Amer. Med. Assoc., 1939, **112**, 1925—1928).—A comprehensive discussion on various methods of treatment. R. L. N.

Adenocarcinoma of breast coincidental with strenuous endocrine therapy. G. R. Allaben and S. E. Owen (J. Amer. Med. Assoc., 1939, **112**, 1933—1934).—A case of adenocarcinoma of the breast in a patient who had received œstrogen therapy for over a year is described. R. L. N.

Movements of the Fallopian tubes in various phases of the menstrual cycle and pregnancy. W. Breiphol (Z. Geburtsh. Gynäk., 1938, **118**, 1—27).—Contractions of the circular and longitudinal muscle fibres of isolated human Fallopian tube, suspended in Tyrode solution, were observed in cases of pre-pubertal, adult, pregnant, and menopausal women. The contractions of the longitudinal muscle fibres are increased during the proliferative phase of the menstrual cycle and reach their climax at the time of rupture of the Graafian follicle. No cyclic changes

of the movements of the circular muscle layer were observed. Pituglandol, hypophysin, thymophysin, follicle or corpus luteum hormone had no action on *in vitro* contractions of the tubes. The peristaltic waves start at the ampulla and move towards the uterus.
S. Sch.

Uterus inhibitory substances in thymus and liver of fœtus. S. Tapfer (Arch. Gynäk., 1939, **168**, 169—177).—Fœtal serum contains substances which inhibit the isolated guinea-pig's uterus. Grafting of fœtal thymus or liver tissue diminishes the sensitivity of the uterus to follicle hormone.
S. Sch.

Uterine hæmorrhage at puberty. E. Kehrer (Z. Geburtsh. Gynäk., 1909, **118**, 205—224).—Severe uterine hæmorrhage during puberty were observed in cases of persistence of the Graafian follicle, thrombopenia, panmyelophthisis, leukæmia, and *C*-avitaminosis. S. Sch.

Pregnanediol excretion in the menstrual cycle. A. M. Hain and E. M. Robertson (Brit. Med. J., 1939, I, 1226—1227).—Pregnanediol excretion in the urine was correlated with endometrial biopsies in 5 women during the menstrual cycle. Excretion was confined to the secretory phase (15th to 30th day) and amounted to 33 to 60 mg. per cycle. C. A. K.

Corpus luteum cystoma. H. Wheelon and G. Wilson (J. Amer. Med. Assoc., 1939, **112**, 2411). —A case is reported. R. L. N.

Action of sex hormones on intestinal function. G. Tsutsulopulos (Arch. Gynäk., 1939, **168**, 608—655).—Oxytocin and œstradiol stimulate tone and peristalsis of the rabbit's small and large intestine *in situ* (*X*-ray control), and in Trendelenburg or Straub's isolated organ preps. Progesterone inhibits tone and movements of the small intestine; tone of the large intestine *in situ* is increased after intramuscular injection. Intravenous injection of anterior pituitary extract (praeloban C) increases tone and peristalsis of the small and large intestine.
S. Sch.

Experiences with female sex hormones. R. Wenner and K. Jöel (Schweiz. med. Wschr., 1939, **69**, 524—529).—20 women with threatening abortion were treated for long periods with progesterone. Pregnancy was maintained in 15 cases. Lactation was prevented in 4 cases with stillborn infants by administration of follicle hormone. Intravenous injection of large doses of follicle hormone started labour in 15 out of 23 women. Hormone treatment of climacteric pruritus and kraurosis vulvæ was unsatisfactory. Good results with follicle hormone treatment were obtained in post-parturition and post-abortion endometritis. A. S.

Estimation of luteal activity and early diagnosis of pregnancy. A. M. Hain and E. M. Robertson (Lancet, 1939, **236**, 1324—1325).—In one case the total urinary excretion of pregnanediol from the 10th to 24th days in the menstrual cycle was 114 mg. (normal 3—60 mg.). On the 28th day of the cycle the Aschheim-Zondek pregnancy test was "indefinite negative" but on the 33rd day was positive. Increased pregnanediol excretion may be useful in diagnosing pregnancy before the first missed period, and before the Aschheim-Zondek test becomes positive.
C. A. K.

Blood-acetone and -lactic acid during parturition and its significance for the contractions of the uterus. H. Winkler and F. Hebeler (Arch. Gynäk., 1939, **168**, 64—78).—Blood-ketone content reaches the upper limits of normal vals. during pregnancy. It increases during labour and diminishes considerably 2—3 hr. after delivery. Blood-ketone content is below that in pregnancy 4—6 days after delivery. Carbohydrate-rich diet in the last months of pregnancy diminishes the blood-ketone concn. Acetone and lactic acid, if added to the isolated non-pregnant and pregnant guinea-pig's uterus, inhibit their contractions. Blood-lactic acid is increased during labour. S. Sch.

Allergic factors in causation of eclampsia. E. Junghans (Arch. Gynäk., 1939, **168**, 656—701).—Repeated injections of eclamptic serum into pregnant rabbits produce severe necrosis of liver cells and marked degenerative changes of the kidney glomeruli and tubules. The changes in non-pregnant rabbits are less marked and resemble those obtained after administration of normal pregnancy serum. Injections of fœtal serum produce marked degenerative changes in liver and kidneys of non-pregnant and, especially, pregnant rabbits. Intracutaneous injection of fœtal serum produces marked local reactions in pre-eclamptic women. (B.) S. Sch.

Factors associated with fœtal and neonatal deaths. E. L. Potter and F. L. Adair (J. Amer. Med. Assoc., 1939, **112**, 1549—1556).—A statistical review. R. L. N.

Chorionepithelioma following ectopic gestation. W. A. Dafoe (Canad. Med. Assoc. J., 1939, **40**, 376—378).—Two cases are described.
R. L. N.

Pelviradiography and clinical pelvimetry. E. M. Rappoport and S. J. Scadron (J. Amer. Med. Assoc., 1939, **112**, 2492—2497).—Observations on 350 parturient women examined roentgenographically are discussed, with special attention to prognosis of the outcome of labour. R. L. N.

Present status of testosterone propionate: three brands, perandren, oreton, and neohombreol (Roche-organon), not acceptable for N.N.R. Council on Pharmacy and Chemistry (J. Amer. Med. Assoc., 1939, **112**, 1949—1951).
R. L. N.

Sterile motile spermatozoa, proved by clinical experimentation. F. I. Seymour (J. Amer. Med. Assoc., 1939, **112**, 1817—1819). R. L. N.

Imbedding of seminal fluid. K. Joel (J. Lab. clin. Med., 1939, **24**, 970—972).—The chief val. is in distinguishing between aspermia and azoospermia. (2 photomicrographs.) C. J. C. B.

Composition of crop milk of pigeons. W. L. Davies (Biochem. J., 1939, **33**, 898—901).—Analytical data are given for four samples from 115 birds. The amounts of dry material, fat, protein, and ash are 28, 33·8, 58·6, and 4·6%, respectively. Carbohydrates

are absent. The protein resembles chicken muscle-protein more closely than egg- or serum-proteins. The fat contains approx. 45% of lecithin which is probably loosely combined with protein. The fat contains no volatile fatty acids nor acids of low mol. wt., and is intermediate between goose and hen fat in degree of unsaturation. J. N. A.

Dangers of employing thorium dioxide solution in mammography. D. C. Collins (Canad. Med. Assoc. J., 1939, **40**, 440—442).—In two cases where the breast was removed 6 or more months after injection of thorotrast for mammography, lesions were present, suggestive of a precancerous condition. R. L. N.

(xiii) DIGESTIVE SYSTEM.

Salivary amylase before and after tonsillectomy. G. Eigler (Arch. Ohr.-, Nas.-, u. Kehlkheilk., 1939, **146**, 105—110). C. E.

Ascorbic acid requirements in patients with peptic ulcer. H. A. Warren, M. Pijoan, and E. S. Emery (New England J. Med., 1939, **220**, 1061—1063).—5 patients with duodenal ulcer utilised 20% more ascorbic acid than normals. The usual Sippy diet contains less than the normal requirement of vitamin-*C*. This deficiency can be remedied by giving the juice of one or two fresh oranges daily. A. M. G.

Gastric ulcers produced by nicotine injections. M. Mosinger and P. Bonifaci (Compt. rend. Soc. Biol., 1939, **131**, 380—382).—The lesions produced in guinea-pigs are described. P. C. W.

Allergy in the pathogenesis of peptic ulcer. I. Ehrenfeld, A. Brown, and M. Sturtevant (J. Allergy, 1939, **10**, 342—348).—75 patients of proved peptic ulcer were studied for evidences of allergic manifestations; 72 allergic individuals were also studied to determine the presence of ulcer. No evidence was found that allergy is an important ætiologic factor in peptic ulcer. A small group among the allergic patients had ulcer-like symptoms, but without demonstrable roentgen signs of ulcer. There were spastic phenomena in the stomach or duodenum or both in each of these cases. This group showed a striking, though not const., association with urticaria and angioneurotic œdema. C. J. C. B.

Effect of loss of pancreatic digestion on protein and amino-nitrogen content of blood. G. Loewy (Compt. rend. Soc. Biol., 1939, **131**, 224—226).—Following anastomosis of the pancreatic duct to the ureter in the dog there is a slight increase in the serum-serine and a regular diminution in the amino-N. P. C. W.

Method of pancreatectomy in pigeons. J. M. Janes (J. Lab. clin. Med., 1939, **24**, 1210—1212). C. J. C. B.

(xiv) LIVER AND BILE.

Takata reaction for liver function. N. G. Ionescu, P. Constantinescu, and N. Popescu (Bull. Mém. Soc. med. Hôp. Bucarest, 1939, **21**, 140—148).—Most cases of liver disease show a positive Takata reaction; in pellagra it is mostly negative. Positive reactions may occur in the absence of liver disease. C. A. K.

Fatty infiltration of liver in the alarm reaction. C. P. Leblond, N. van Thoia, and G. Segal (Compt. rend. Soc. Biol., 1939, **130**, 1557—1559).—Colchicine injection, *X*-irradiation, cold, and starvation produce the symptoms of the alarm reaction in rats and mice. One of these symptoms is fatty infiltration of the liver. This lesion does not appear in the adrenalectomised animal. P. C. W.

Effect of ligature of hepatic duct on protein and amino-acid content of serum. G. Loewy (Compt. rend. Soc. Biol., 1939, **130**, 1545—1547).—Following ligature of the hepatic duct in the dog the total protein and serine content of the serum is diminished. The globulin and amino-acid content is raised. P. C. W.

Origin and localisation of pigment in amphibian liver. E. De Robertis (Rev. Soc. argent. Biol., 1939, **15**, 87—93).—Pigment in the liver of *Bufo arenarum* is scarce in summer; it increases in autumn and winter, reaching its max. at the time of sexual activity (October); afterwards it decreases. A high temp., hypophysectomy, or prolonged fasting increases the pigment. The pigment is found in Kupffer's cells when it is scarce, but occupies the parenchymatous cells when it is abundant. There are two different pigments, a yellow one with ionic Fe and a brown one without ionic Fe. The latter contains Fe detectable by micro-incineration. Thus not only the reticulo-endothelial cells of the liver and spleen, but also the liver cells, play an important rôle in pigment metabolism in *B. arenarum*. J. T. L.

Relation between chondriome and iron and pigment metabolism in amphibian liver. E. De Robertis (Rev. Soc. argent. Biol., 1939, **15**, 94—96).—Observation of the liver of *B. arenarum* after prolonged fasting showed that the yellow pigment and Fe accumulate in the liver cells around the chondriome. J. T. L.

Ultra-violet absorption spectra of bile-pigment iron compounds and of some bile pigments. H. F. Holden and R. Lemberg (Austral. J. Exp. Biol., 1939, **17**, 133—143).—The ultra-violet absorption of hæmatin compounds intermediate between protohæmatin and biliverdin, and also of some bile pigments, was studied. Of these compounds, only hydroxyporphyrin-hæmochromogen, which still contains the intact porphyrin ring, possesses a typical Soret band. Verdohæmochromogen, choleglobin, and cholehæmochromogen, as well as the bile pigments, do not show this band. The open ring structure attributed by Lemberg to these hæmatin compounds is thus confirmed. D. M. N.

Biliary excretion of sodium tetraiodophenolphthalein and its intestinal absorption. Tomodo-Sigeto (Fukuoka Acta Med., 1939, **32**, 59).—In dogs Na tetraiodophenolphthalein is excreted mainly in the bile, the max. concn. being reached in 1—2 hr. If hypertonic glucose is administered simultaneously, the excretion of the dye and its concn. in the gall-bladder are increased. The absorption of the dye from the intestine is enhanced

by bile salts, due to interaction between deoxycholic acid and the dye. W. D'A. M.

Bile acids. LVI. Gall stone containing lithocholic acid from a pig. M. SCHENCK (Z. physiol. Chem., 1939, **260**, 185—188).—Reinvestigation (cf. A., 1939, III, 150) shows that no β-accompanies the α-lithocholic acid present. The cholesterol content is higher than previously supposed from the Salkowski reaction. H. B.

(xv) KIDNEY AND URINE.

Effect of experimental production of accessory blood supply on normal kidney. H. A. DAVIS and I. F. TULLIS, jun. (Proc. Soc. Exp. Biol Med., 1939, **40**, 161—164).—Omentum was grafted into the cortex of the dog's kidney. Increased renal circulation with diuresis, increased urea clearance, and phenolsulphonephthalein excretion occurred. V. J. W.

Value of omentopexy in establishing an adventitious circulation in the normal kidney. W. DE B. MACNIDER and G. L. DONNELLY (Proc. Soc. Exp. Biol. Med., 1939, **40**, 271—272).—Technique and histological results of grafting omentum into the cortex of the kidney in dogs are described. V. J. W.

Effects of sucrose on kidney. H. H. CUTLER (Proc. Staff Mayo Clin., 1939, **14**, 318—320).—Of patients showing hydropic degeneration of the convoluted tubules of the kidney, 36·4% had received intravenous sucrose within a week preceding death, whereas only 1·3% of non-hydropic cases had had sucrose. A. M. G.

Nephropathic action of cystine and cysteine. H. BEUMER and R. HÜCKEL (Klin. Woch., 1937, **16**, 78—79; Chem. Zentr., 1937, i, 1722).—Cystine disease in infancy is due to the action of cystine on the renal parenchyma. Rats fed with cystine and cysteine developed nephrosis and fatty livers. Metabolism of cysteine probably occurs through cystine. A. J. E. W.

Pathogenesis of immunocytotoxic glomerulonephritis. S. TSUJI, H. CHIKAMUTSI, F. IZUMI, and Y. HISHIDA (Folia endocrinol. japon., 1939, **14**, 99—112). E. R.

Fluid of serous renal cysts. G. GENNARI (R. Ist. San. Pubbl., 1939, **2**, 207—212).—Fluid (67 c.c.; d^{15} 1·1015, p_H 8·6) from a serous cyst from a case of horseshoe kidney contained NaCl (0·702), urea (0·146), protein (1·2%), PO_4''', cholesterol, leucocytes, and traces of glucose; it gave a positive Rivalta reaction. F. O. H.

Urology. W. C. QUINBY (New England J. Med., 1939, **220**, 920—923).—A review of progress. A. M. G.

Effect of corynanthine and yohimbine on water diuresis. E. ZUNZ and O. VESSELOVSKY (Compt. rend. Soc. Biol., 1939, **131**, 135—138).—Injection of yohimbine into dogs causes a decrease in the quantity of urine with an increase in excretion of Cl′ and urea; the anti-diuretic action of corynanthine is considerably greater. H. G. R.

Gluconic acid as urinary acidifying agent in man. H. GOLD, H. CIVIN, and C. SALZMAN (J. Lab. clin. Med., 1939, **24**, 1139—1146).—Under controlled conditions δ-gluconolactone in large doses reduced the p_H of the urine to low figures but under ordinary conditions of diet and fluid intake the compound was not effective and caused a high incidence of gastro-intestinal disturbances. C. J. C. B.

Different forms of urinary acidity produced during 24 hours. S. BELLUC, J. CHAUSSIN, H. LAUGIER, and T. RANSON (Compt. rend., 1939, **208**, 1935—1937).—Determinations of phthalein, phosphatic, org., and formol acidity were made on 4-hourly specimens of urine from a patient on a const. diet (cf. A., 1938, III, 918). Over 24 hr., the formol acidity was about 3 times the total acidity. After the first meal, the total and formol acidities were low; at night they were high, corresponding with the lowered pulmonary ventilation, and some org. acidity was present. During waking hours, phosphatic exceeded phthalein acidity and there was no org. acidity. J. L. D.

Porphyrinuria at high altitude. K. LANG (Biochem. Z., 1939, **301**, 357—361).—In man, urinary excretion of porphyrin increases with increase in altitude (2900—4638 m.) of place of residence. The increase is scarcely or not at all affected by reduction of temp. or by increased exposure to solar radiation but is due in part to severe body exercise. There is no connexion between porphyrinuria and production of hæmoglobin. Possibly acidosis which precedes acclimatisation to high altitude and disturbances of liver function are the immediate causes of the porphyrinuria. W. McC.

(xvi) OTHER ORGANS, TISSUES, AND BODY-FLUIDS.

Physiology. H. E. HOFF (New England J. Med., 1939, **220**, 1067—1072).—A review of progress. A. M. G.

Pathology. T. B. MALLORY (New England J. Med., 1939, **220**, 1037—1041).—A review of progress. A. M. G.

Plasmalogen. IV. New group of phosphatides (acetalphosphatides). R. FEULGEN and T. BERSIN (Z. physiol. Chem., 1939, **260**, 217—245; cf. A., 1939, III, 68, 394).—The plasmal contents of the phosphatides of muscle, brain, and liver and that of egg-lecithin are 10—12, 8—10, approx. 1, and less than 0·1%, respectively. The isolation of plasmalogen (average plasmal content 55%) from the phosphatides of ox muscle is described. Accompanying phosphatides are removed by alkaline hydrolysis which, in proportion to its duration, liberates plasmalogenic acid from plasmalogen which is pptd. with brucine acetate. The acid, which contains 35% of plasmal but no N, is probably a mixture of cyclic acetals derived from plasmal and equal parts of α- and β-glycerophosphoric acid since treatment of the Li salt with dil. acetic acid yields equimol. amounts of plasmal and glycerophosphoric acids. Plasmalogen, treated with benzene, yields a cryst. acetalphosphatide mixture which gives a mixture of the colamine esters

of α- and β-glycerophosphoric acids on heating with aq. $HgCl_2$. In the acetals, one acid group of the phosphoric acid residue remains free; hence plasmalogen yields a water-sol. K salt. Possibly analogous acetalphosphatides containing other bases (*e.g.*, choline) in place of colamine occur in the organism. In the determination of plasmal, flocculation is avoided by replacing the acetic acid used as solvent by a 0·1% solution of lecithin (from egg-yolk) in acetic acid, and interference by colour in the amyl alcohol is prevented by rapid working. α-Palmitalplasmalogen is probably

$$Me\cdot[CH_2]_{14}\cdot CH<\begin{matrix}O\cdot CH_2\\ O\cdot CH\cdot CH_2\cdot O\cdot PO(OH)\cdot O\cdot[CH_2]_2\cdot NH_2\end{matrix}.$$

W. McC.

Lead in human tissues. K. N. Bagchi, H. D. Ganguly, and J. N. Sirdar (Indian J. Med. Res., 1939, **26**, 935—945).—Pb is normally present in all human tissues in quantities varying with the diet, the amount being higher in Europeans than in Indians. The dithizone method was used for the determinations. Bone, tooth, and hair retain large quantities of Pb, the max. being in hair, the colour of which depends on its Pb content; the skin is poor in Pb. The ovary (unlike the testis) is the only organ containing no Pb, and fœtal tissues do not show affinity for it. In cases of abnormal exposure to Pb, the liver, stomach, kidney, and lungs showed marked increase in Pb content. H. B. C.

Distribution of bromide and chloride in tissues and body fluids. E. G. Weir and A. B. Hastings (J. Biol. Chem., 1939, **129**, 547—558).—Replacement of Cl′ by Br′ after oral or intravenous ingestion of NaBr is essentially the same for all tissues except the c.s.f. and the brain, where it is lower, and it appears that the c.s.f. is in equilibrium with the extracellular fluid of brain tissue. Good agreement between the amounts of extracellular fluid of tissues calc. from the Cl′ and Br′ data is observed. H. G. R.

Sulphur content of diaphyses and epiphyses. J. Enselme, L. Revol, and P. Trintignac (Compt. rend. Soc. Biol., 1939, **131**, 278—279).—The epiphyses of guinea-pigs contain a higher concn. of S and org. matter than do the diaphyses. H. G. R.

Human epidermis. III. Occurrence of methionine in epidermis (stratum corneum). V. A. Wilkerson and V. J. Tulane (J. Biol. Chem., 1939, **129**, 477—479; cf. A., 1936, 225).—Epidermis contains cystine 2·38, methionine 2·47, and total S 1·09%. Cystine- and methionine-S represent 55·96 and 48·62% respectively of the total S. This is in contrast with other keratins, which have high cystine and relatively low methionine contents. Whilst the amount of cystine in sclero-proteins increases with the degree of keratinisation the amount of methionine probably decreases. J. N. A.

Proteins in whey. M. Sørensen and S. P. L. Sørensen (Compt. rend. Trav. Lab. Carlsberg, Sér. Chim., 1939, **23**, 55—99; cf. A., 1938, III, 693).—Caseinogen was pptd. from milk by acids or $(NH_4)_2SO_4$ and from the filtrate were prepared the following fractions. (*a*) Lactomucin, containing sugar, glucosamine, and P, but only small amounts of tryptophan and associated with a green pigment; it is only slightly sol. in water and neutral salt solutions. (*b*) A protein associated with a red pigment and containing sugar, glucosamine, P, and a large amount of tryptophan; it is readily sol. in water and dil. salt solutions. (*c*) The cryst. globulin of Palmer (A., 1934, 434); crystallisation of this protein is effected by pptn. with $(NH_4)_2SO_4$ at p_H 6—7. (*d*) A gelatinous substance, sol. in water and dil. salt solutions but insol. in 50%-saturated aq. $(NH_4)_2SO_4$. Pptn. at p_H 6—7 by $(NH_4)_2SO_4$ gives a cryst. product. (*e*) A substance insol. in water and salt solutions at p_H 4—6 but sol. in aq. NH_3 at p_H 6·5—7·0 from which a cryst. product can be pptd. by $(NH_4)_2SO_4$. Palmer's globulin can be converted into the gelatinous substance and vice versa; the substance (*e*) appears to be distinct from these two substances. Analytical methods and the results of gradual fractionation by $(NH_4)_2SO_4$ are described. F. O. H.

Distribution of aliphatic alcohols between the cell fluid of aquatic animals and the surrounding water. Mol. wt. and surface activity. R. Jacquot and A. Lindenberg (Compt. rend., 1939, **208**, 2020—2022).—The ratio of the concn. of intracellular alcohol in *Gobio fluviatilis*, *Gasterosteus leiurus*, and *Blennius pholis* to that in the aquarium is 0·78—0·99 for different aliphatic alcohols. The ratio for a given alcohol is the same for the three fish. For methyl, ethyl, and *iso*propyl alcohol the ratio is inversely proportional to the mol. wt. For the higher alcohols, sol. in lipins, the ratio rises and is almost unity with *iso*amyl alcohol. J. L. D.

Xanthine as constituent of the pigment of the wings of Pieridæ. R. Purrmann (Z. physiol. Chem., 1939, **260**, 105—107).—The basic portion of the mixture of pterins from the wings of *Catopsilia argante*, *C. rurina*, and *C. statira* consists almost entirely of xanthopterin, guanopterin, and xanthine, the min. yields of xanthine on the wings of 1 specimen of these species being 0·2, 0·1, and 0·015 mg. The xanthine is obtained by crystallisation from conc. and dil. H_2SO_4. W. McC.

Amphiporine, an active base from the marine worm *Amphiporus lactifloreus*. H. King (J.C.S., 1939, 1365—1366).—By extraction with ethyl alcohol, amphiporine (oily picrate; cf. Bacq, A., 1937, III, 350), not identical with nicotine, has been isolated. F. R. S.

Chemical composition of *Cysticercus fasciolaris*. L. F. Salisbury and R. J. Anderson (J. Biol. Chem., 1939, **129**, 505—517).—The lipins consist of 30% phospholipins (mixture of lecithin and kephalin), cholesterol, and cerebrosides with small amounts of glycerides. On hydrolysis of the phospholipins equal proportions of saturated and unsaturated acids are obtained and the water-sol. fraction is glycerophosphoric acid, choline, and aminoethyl alcohol. The ash content is over 16% on the dry larvæ and consists mainly of $Mg_3(PO_4)_2$ and $Ca_3(PO_4)_2$. The dried larvæ contain practically no reducing sugar, small amounts of hexosamine, cysteine, creatine, creatinine, NH_3, urea, and uric acid, and 30% of glycogen. H. G. R.

Lysophosphatides. E. CHARGAFF and S. S. COHEN (J. Biol. Chem., 1939, **129**, 619—628).—Lysophosphatides formed by the action of moccasin, cobra, or fer-de-lance venom on egg yolks contain 30—34%, 20%, and 24·5% of lysokephalin respectively. Smaller yields of lysophosphatides are obtained at 30° than at 38°. Snake venoms do not convert kephalin or kephaloproteins into lysokephalin. Neither lysokephalin nor lysolecithin influences blood-clotting time. E. M. W.

Toad poisons. V. Constitution of bufalin.—See A., 1939, II, 442.

(xvii) TUMOURS.

Production of precancerous conditions by mild continuous trauma. F. D. REZZESI (Z. Krebsforsch., 1939, **49**, 165—200).—The ears of a no. of rabbits and guinea-pigs were subjected to rubbing with a leather strap for 4—6 hr. daily for 4—5 months. The resulting skin changes were erythema, depilation, desquamation, and hyper- and parakeratoses. The changes were reversible. E. M. J.

Innervation of ear and effect of local continuous trauma in rabbits. F. D. REZZESI (Z. Krebsforsch., 1939, **49**, 201—214).—Section of the cervical sympathetic, the great auricular nerve, or both had no definite influence on the skin changes following continuous traumatism (see preceding abstract). E. M. J.

Implantation of sarcoma into brain of rabbits, and the glycogen content of heart and liver. T. TOKUYA (Fukuoka Acta Med., 1939, **32**, 35—36).

Endemic carcinoma of the ethmoid in sheep. K. NIEBERLE (Z. Krebsforsch., 1939, **49**, 137—141).—Multiple occurrence of carcinoma of the ethmoid in a herd of sheep is described. E. M. J.

Glycolysis of erythrocytes in diagnosis of carcinoma. P. MEYER-HECK (Z. Krebsforsch., 1939, **49**, 142—153).—The average lactic acid production in 34 tumour cases was 66% higher than in 37 non-tumour cases; 23% of tumour cases and 8% of non-tumour cases gave paradoxical results. Activation by addition of carotene does not lead to a better evaluation. E. M. J.

Pituitary tumour associated with choked discs and normal peripheral fields of vision. H. S. WAGENER, H. W. WOLTMAN, and J. G. LOVE (Proc. Staff Mayo Clin., 1939, **14**, 417—419).—Report of a case. A. M. G.

(xviii) NUTRITION AND VITAMINS.

Diet survey of families with leprosy. W. R. AYKROYD and B. G. KRISHNAN (Indian J. Med. Res., 1939, **26**, 897—900).—A diet survey of 14 families, 13 of which contained cases of leprosy, showed the diet to be deficient in quantity and quality. H. B. C.

Diet surveys in the Nilgiris and Travancore. B. G. KRISHNAN (Indian J. Med. Res., 1939, **26**, 901—905).—The diets of tea plantation labourers in Nilgiris and of villagers in Travancore are inadequate. Children in the tapioca-eating district (Travancore) are smaller and lighter than children in other parts of South India living on a rice staple; this is ascribed to low protein intake. H. B. C.

Survey of diet and nutrition in Najafgarh, Delhi province. K. L. SHOURIE (Indian J. Med. Res., 1939, **26**, 907—920).—The survey included 101 families, and 19 persons in the District Board School Hostel, and was over a period of 10 days during cool and hot seasons. The diet was markedly deficient in fruit and vegetables. In the hostel, calorie intake was reduced in the hot season. The state of nutrition of 1483 children showed a good general condition. H. B. C.

Nutritional investigations on Bengal fish. K. C. SAHA and B. C. GUHA (Indian J. Med. Res., 1939, **26**, 921—927).—The % quantities of water, body-fat, ash, protein, and available Fe in 24 different varieties of Bengal fresh-water fish are given. H. B. C.

Comparative nutritive value of firm and watery egg-albumin. N. B. GUERRANT and W. J. RUDY (Proc. Soc. Exp. Biol. Med., 1939, **40**, 166—169).—No significant differences were found. V. J. W.

Inadequacy of a whole-milk ration for dairy calves as manifested in changes of blood composition and other physiological disorders. G. H. WISE, W. E. PETERSEN, and T. W. GULLICKSON (J. Dairy Sci., 1939, **22**, 559—572).—Dairy calves restricted to a whole-milk diet for 50—300 days developed pronounced anæmia and many symptoms of physiological disturbance. Marked variations in growth and sudden changes in the colour of blood plasma were also observed. High vals. for blood-sugar and plasma-fat, and low vals. for hæmoglobin, Mg, and sometimes for P and Ca, were found. J. G. D.

Value of various vitamins and inorganic salts for overcoming symptoms manifested in calves restricted to a whole-milk ration. G. H. WISE, T. W. GULLICKSON, and W. E. PETERSEN (J. Dairy Sci., 1939, **22**, 573—582).—Practically all the symptoms resulting from feeding only a whole-milk diet to calves may be removed by addition of Fe, Cu, Mg, and cod-liver oil. Experiments were continued up to advanced gestation. The factors controlling the lowering of the plasma-Mg are discussed together with the possible significance of rare minerals, the grass juice factor, and vitamin-B_4. J. G. D.

Fruit and vegetable diet and mineral salt metabolism. W. NONNENBRUCH (Wien. klin. Wschr., 1939, **52**, 705—708).—A lecture. A. S.

Influence of sucrose on food value. I—V. J. Z. SCHNEIDER and K. WILLERT (Chem. Obzor, 1938, **13**, 187—201, 232—243).—Substitution of sucrose in various quantities in a "perfect" diet was tried in comparative feeding tests on white rats. Sucrose in any quantity does not give rise to rickets, and in small quantities (*e.g.*, 10% of the calorific val. of the food) the results are distinctly favourable. F. R.

Alimentary value of hydrogenated oils. A. GALAMINI (R. Ist. San. Pubbl., 1939, **2**, 312—328).—Rats on a diet containing hydrogenated olive or coconut oil as source of fat grow and reproduce normally. F. O. H.

Effect of starvation on composition of fat tissue. E. CREMER (Arch. exp. Path. Pharm., 1939, **192**, 573—585).—In starving rats the testicular fat body loses 95% of its initial wt. and 99·5% of its initial fat content. If the starvation is more protracted, the loss of fat content is less, although the loss in wt. of the fat body is greater. H. BL.

Copper content of [Indian] foods. S. C. CHOUDHURY and U. P. BASU (Indian J. Med. Res., 1939, **26**, 929—934).—A no. of the nuts, pulses, cereals, and fishes have the highest Cu contents, whereas cow's milk is low in Cu. It is improbable that there is a deficiency of Cu in any adult mixed diet, although there is in the case of infants fed on cow's milk. H. B. C.

Vitamins and the nervous system. E. GRÜNTHAL (Z. Vitaminforsch., 1939, **9**, 255—280).—A review.

Water-soluble vitamins. A. S. MEIKLEJOHN (New England J. Med., 1939, **220**, 518—524).—A review. A. M. G.

Importance of the liver in overdosage of vitamin-*A* and carotene. II. Function of the liver in overdosage of vitamin-*A*. I. IKEGAKI (Z. Vitaminforsch., 1939, **9**, 1—8; cf. A., 1938, III, 503).—Examination of blood-sugar and liver-glycogen in guinea-pigs and rabbits indicates that moderate dosage of vitamin-*A* stimulates hepatic function. Large doses of -*A*, however, impair hepatic function and this is evident before the onset of hypervitaminosis-*A*. F. O. H.

Morphological changes from vitamin-*A* overdosage. H. NOETZEL (Z. ges. exp. Med., 1939, **105**, 83—88).—Rats were treated with daily oral doses of 12,000—80,000 units of vitamin-*A* for 13—28 days. The thyroid gland was unchanged. Fat storage in the reticulo-endothelial system was found in liver, spleen, and bone marrow. Wasting, decrease in liver-glycogen, and nephrotic changes in the kidneys were found with the larger doses. A. S.

Action of various carotenoids on onset of hibernation. E. KLAR (Z. ges. exp. Med., 1939, **105**, 161—167).—Hibernation of hedgehogs in May was produced by injection of β-carotene in May; α-carotene, xanthophyll, lycopene, crocin, and vitamin-*A* were ineffective. Injection of β-carotene in July was less effective. A. S.

Bone overgrowth and nerve degeneration produced by defective diet. E. MELLANBY (J. Physiol., 1939, **96**, 36—37P).—Widespread nerve degeneration is produced in young and adult animals (dogs, rabbits, rats) by diets deficient in vitamin-*A* (and carotene) and rich in cereals (cf. A., 1938, III, 923; 1939, III, 135). This is due to overgrowth of bone compressing the nerves (auditory, trigeminal, optic, spinal); also the pituitary body may be compressed. The femur, radius, ulna, and ribs may show similar overgrowth. J. A. C.

Human vitamin-*A* deficiency. G. WALD and D. STEVEN (Proc. Nat. Acad. Sci., 1939, **25**, 344—349).—Dark-adaptation measurements on a vitamin-*A*-deficient subject showed that after 3 or 4 days of deficiency the logarithm of the threshold of vision of both cones and rods rose linearly until on the 34th day the cone plateau was 3·4 times, and the rod plateau 9·1 times, the normal average. 12—14 min. after administration of carotene, the rod threshold began to fall and was normal within 100 min. E. M. W.

Vitamin-*A* action of [the carotenoids] aphanene and aphanicene. A. SCHEUNERT and K. H. WAGNER (Z. physiol. Chem., 1939, **260**, 272—275).—Experiments with rats suffering from vitamin-*A* deficiency show that the min. daily curative dose of aphanene is approx. 2·5 μg. and that of aphanicene more than 5 μg. Aphanene has approx. half the activity of β-carotene. W. McC.

Seasonal variations in vitamin-*A* content of visceral organs of the geelbek or Cape salmon (*Atractoscion aequidens*, C and V). C. J. MOLTENO and W. S. RAPSON (Biochem. J., 1939, **33**, 1390—1393).—Vitamin-*A* is associated with fat assimilation in the geelbek, the content being greatest when the fish is fat, and varying inversely as the I val. P. G. M.

Presence of vitamin-*A* and carotenoids in the olfactory area of the steer. N. A. MILAS, W. M. POSTMAN, and R. HEGGIE (J. Amer. Chem. Soc., 1939, **61**, 1929—1930).—The epithelium of the olfactory area of steers contains (absorption max.) vitamin-*A* and other absorbing substances. R. S. C.

Vitamin-*A* content of human milk. A. CHEVALLIER, P. GIRAUD, and C. DINARD (Compt. rend. Soc. Biol., 1939, **131**, 373—375).—Even with similar diets, variations occur in the vitamin-*A* content of the milk. In the same subject, an increase in -*A* usually accompanies an increase in the fat content. H. G. R.

Comparative vitamin-*A* contents of blood and milk. A. CHEVALLIER, P. GIRAUD, and C. DINARD (Compt. rend. Soc. Biol., 1939, **131**, 396—398).—The concn. of vitamin-*A* in human milk is less, and that in the colostrum greater, than that in the blood. The concn. of -*A* in bitches' milk is greater than that of the blood or of human milk. H. G. R.

Effect of pasture on carotene content of blood plasma of cattle. L. A. MOORE (J. Dairy Sci., 1939, **22**, 513—519).—Plasma-carotene of Guernsey cattle is higher than that of Jersey, and this is higher than in Ayrshire, Friesian, and Brown Swiss cattle. A similar relationship holds for butter fat. True vitamin-*A* therefore varies inversely with carotene content under similar feeding conditions. On going to pasture, the greater the milk production the higher was the plasma-carotene. In any breed heifers had lower vals. than milking cows both in summer and in winter. Feeding freshly cut lucerne resulted in a rapid rise in plasma-carotene. J. G. D.

Determination of blood plasma-carotene in cattle using a photo-electric colorimeter. L. A. MOORE (J. Dairy Sci., 1939, **22**, 501—511).—15 ml.

of 95% alcohol are added to 10 ml. of plasma and shaken to ppt. proteins. 5 ml. of light petroleum are then added to extract carotene; emulsions may be eliminated by adding 0·5 ml. of alcohol. Petroleum of b.p. 73—76° and extraction at 10—12° gave true carotene vals. Consistent results could be obtained from day to day, and plasma could be stored at 2° for three weeks without loss of carotene. An Evelyn micro-photo-electric colorimeter was used. J. G. D.

Spectroscopic methods of vitamin measurement. R. L. McFarlan (Proc. Sixth Conf. Spectros., 1938, 20—26).—The ultra-violet absorption spectrum of a solution of vitamin-*A* concentrate is discussed. The determination of -*A* by the photometric measurement of absorption in the region of 3280 A. by means of the Spekker spectrophotometer, the Hilger vitameter, the Milas–Farmer photo-electric photovitameter, the McFarlan–Reddie–Merrill vitamin-*A* meter, and the Bills–Wallenmeyer electronic photometer is described. As the absorption curve of -*A* varies with the source, this must be taken into account when converting absorption coeffs. into biological activity. As both cod- and halibut-liver oil have their absorption max. at 3280 A. the possible existence of -A_2 is not of importance in the above methods of determination. A. J. M.

Determination of vitamin-*A* by destructive irradiation. B. Demarest (Z. Vitaminforsch., 1939, **9**, 20—31).—With conc. vitamin-*A* preps., total radiation of the Hg arc diminishes absorption at 3280 A. by 98% without increasing the absorption at any λ in the ultra-violet range; the longer λ of the ultra-violet are less effective than the shorter λ. With preps. of low potency, destruction of -*A* is much slower than with conc. preps., whilst irradiation of milk produces changes in absorption in no way related to the destruction of -*A*. Irradiation of solutions of conc. -*A* preps. in abs. alcohol does not produce an equilibrium point for the extinction at 3280 A. down to 16% of its initial val. The bearing of the results on the determination of -*A* by destructive irradiation is discussed (cf. De, A., 1937, III, 324). F. O. H.

Determination of vitamin-*A* in the alcoholic form. A. Chevallier, P. Dubouloz, and R. Matheron (Compt. rend. Soc. Biol., 1939, **131**, 372—373).—A method for the determination of vitamin-*A* in the alcohol form (prep. free from pigment from fish-liver oil described) involves ultra-violet photochemical transformation of -*A* (cf. A., 1936, 1159). H. G. R.

Clinical observations on the effect of the vitamin-*B* complex from liver on tubercular patients. III. Physical strength of the patients. M. Ishii (Bull. Inst. Phys. Chem. Res. Japan, 1939, **18**, 451—471; cf. A., 1938, III, 596).—After another year (total period 3 years) of treatment with vitamin-*B* complex 4 of the 9 patients previously considered were cured and 4 others had maintained the improvement recorded at the end of the second year. W. McC.

Vitamin-*B* as a growth-factor for mosquito larvæ (*Anopheles* and *Culex*). E. Sergent (Compt. rend. Soc. Biol., 1939, **131**, 179—180).—Addition of vitamin-*B* to the medium allows development of *A. maculipennis* and *C. pipiens* on artificial diets in the dark. H. G. R.

Variations in the reduced glutathione content of pigeon tissues in total avitaminosis-*B* and acute carbohydrate alimentary disequilibrium R. Lecoq and E. Flender (Compt. rend., 1939, **208**, 2022—2024).—The reduced glutathione contents of muscle, liver, spleen, kidney, heart, and brain of pigeons maintained on different diets (details given) were determined. The diets rich in carbohydrate caused a marked fall in muscle-glutathione, whereas avitaminosis-*B* and carbohydrate disequilibrium increased that of the spleen, which atrophied; there was increased excretion of bile pigment. The glutathione contents of brain and liver were slightly increased on the artificial "complete" diet and in carbohydrate disequilibrium but were diminished in the heart in avitaminosis-*B*. J. L. D.

Metabolism of vitamin-B_1. H. M. Sinclair (J. Physiol., 1939, **96**, 55—56P).—This vitamin circulates in the plasma in the free unphosphorylated form which diffuses readily and passes into tissue fluid, c.s.f., urine, and cells of the body. Probably all nucleated cells can phosphorylate the vitamin with formation of cocarboxylase. Serum may also contain a compound of unphosphorylated vitamin and protein. J. A. C.

Relationship between vitamin-*B* [complex] and ketone metabolism. P. E. Simola (Biochem. Z., 1939, **302**, 84—102; cf. A., 1936, 646; 1938, 511).—In rats maintained for long periods on a diet deficient in all the vitamins of the *B* group the keto-acid content of the urine is usually, and in those on a diet deficient in -B_1 (autoclaved yeast as source of *B* vitamins) almost invariably, greatly above the normal val., the chief acid responsible being α-ketoglutaric. These vals. are reduced, but usually not to the normal level, by administration of vitamin-B_1 with or without lactaflavin. No increase in the content is observed in avitaminosis-*A* or -*C*. When the diet is free from *B* vitamins or when the source of these is autoclaved yeast (but not when the yeast is given together with -B_1) the bisulphite-binding power of the blood increases. Apart from its effect on keto-acid metabolism, deficiency of *B* vitamins appears to have no effect on ketone metabolism (*e.g.*, on urinary excretion of methylglyoxal). W. McC.

Negative effect of chronic morphinism on the anorexia characteristic of vitamin-B_1 deficiency. G. R. Cowgill (Proc. Soc. Exp. Biol. Med., 1939, **40**, 201—202).—Morphinism does not increase vitamin-B_1 requirements in dogs. V. J. W.

Assessing level of nutrition. Carbohydrate tolerance test for vitamin-B_1. I. Experiments with rats. G. G. Banerji and L. J. Harris (Biochem. J., 1939, **33**, 1346—1355).—In rats suffering from vitamin-B_1 deficiency, increased amounts of pyruvic acid (or bisulphite-binding substances) are excreted in the urine even when the deficiency is slight, the amount excreted being proportional to the degree of the deficiency. The abnormal excretion is accentuated by oral administration of Na lactate.

Lactate has no effect when there is no deficiency but sensitivity to lactate increases with degree of deficiency. Graded curative doses of -B_1 produce correspondingly graded responses. The optimum amount of -B_1 needed to secure normal carbohydrate metabolism is much greater than the ordinary protective amount. The application of the findings to the determination of the -B_1 contents of food and of the level of human nutrition is indicated. W. McC.

Vitamin-B_1 in the animal organism. III. Maximum storage of vitamin-B_1 in various species. P. C. Leong (Biochem. J., 1939, **33**, 1394—1396).—The highest concns. of vitamin-B_1 in the muscle and liver were found to be: guinea-pig 0·3 and 0·7, fowl 0·3 and 0·7, pigeon 1·2 and 1·1, rat 0·6 and 2·6 I.U. per g. P. G. M.

Applications of ultra-violet absorption spectra in establishing the structure of vitamin-B_1. A. E. Ruehle (Proc. Sixth Conf. Spectros., 1938, 27—30).—A review showing how absorption determinations were utilised in the determination of the structure of vitamin-B_1. A. J. M.

Kinetics of thermal decomposition of vitamin-B_1 hydrochloride in aqueous solution. I. A. Watanabe (J. Pharm. Soc. Japan, 1939, **59**, 52—56).—The influence of temp. on speed of decomp. of aq. solutions of vitamin-B_1 hydrochloride is examined. Data are recorded for 0·005—0·1% solutions, at 100—140°, for 1—6 hr. Reaction velocity is influenced by [H$^+$]. Thermal decomp. of -B_1 is not a simple unimol. reaction. A. T. P.

Methods of determination of vitamin-B_1 and their application in physiology and medicine. H. G. K. Westenbrink (Dansk Tidsskr. Farm., 1939, **13**, 173—188).—A review. M. H. M. A.

Determination of vitamin-B_1 in urine. F. Widenbauer, O. Huhn, and R. Ellinger (Z. ges. exp. Med., 1939, **105**, 138—144).—Ritsert's method for vitamin-B_1 determination in urine is preferred to that of Karrer or of Widenbauer, Huhn, and Becker. Daily urinary excretion of -B_1 was 1—2 μg. per kg. body-wt. under various clinical conditions. A. S.

Assessing level of human nutrition. Determination of vitamin-B_1 in urine by the thiochrome method. Y. L. Wang and L. J. Harris (Biochem. J., 1939, **33**, 1356—1369).—Using 5 ml. of urine, rapidity, simplicity, and accuracy (error usually less than approx. 10%) are achieved by omitting adsorption of the vitamin, removing preformed thiochrome and other interfering substances from the urine by preliminary extraction with *iso*butyl alcohol, using only the necessary amount of $K_3Fe(CN)_6$ as determined by a separate control test, using reagents and filter-paper free from fluorescent substances, again removing interfering substances by washing the final *iso*butyl alcohol solution with water, matching the fluorescence of the sample and that of the standard with the eye, and carrying out a blank experiment. The results agree well with those of biological determinations. Healthy persons excrete daily in the urine 30—160 (usually 50—80) I.U. of -B_1. In pregnancy and anorexia, and when utilisation is faulty, the amounts excreted are smaller. W. McC.

Rat bradycardia method of determining vitamin-B_1. A. Z. Baker and M. D. Wright (Biochem. J., 1939, **33**, 1370—1374; cf. Harris *et al.*, A., 1934, 705; 1937, III, 280).—Details of the method as applied during a 5-year period are given. Statistical analysis of 1462 responses of rats to administration at 3 levels of international standard, acid-clay adsorbates shows that mean vals., plotted against the logarithms of the doses, fall on a straight line, that responses to other vitamin-B_1-containing substances similarly treated fall on lines parallel to that obtained with the standard, and that the degree of accuracy of the method is satisfactory when compared with that of other biological methods. Comparison of responses to wheat germ and yeast does not suggest that the method is non-sp. (cf. Williams and Spies, "Vitamin-B_1," 1938). W. McC.

Biological determination of vitamin-B_1 content of blood with *Phycomyces blakesleeanus*. G. Guhr (Klin. Woch., 1939, **18**, 1028—1031).—The vitamin-B_1 content of whole blood was determined by the biological test of Schopfer and Jung (cf. A., 1938, III, 504) in healthy persons, pregnant women, cases of hyperemesis gravidarum, carcinoma, and other diseases; the vals. varied between traces and the recognised normal limits (8—10 μg.-%); pregnancy lowered the -B_1 content in most cases. E. M. J.

Ultramicro-determination of thiamine by fermentation method. L. Atkin, A. S. Schultz, and C. N. Frey (J. Biol. Chem., 1939, **129**, 471—476).—The method, which depends on the fact that thiamine under suitable conditions causes a pronounced stimulation in the rate of alcoholic fermentation, is described. It is based on the fermentation test of Schultz *et al.* (A., 1938, III, 130, 676). The determination is carried out in a Warburg apparatus in N_2 and 0·005 to 0·025 × 10^{-9} g. of thiamine can be determined. Error is ±5%. J. N. A.

Joint chemical determination of vitamin-B_1 and cocarboxylase. P. Meunier and C. P. Blanchpain (Ann. Ferm., 1939, **5**, 153—167).—In a combination of the azo-reaction and thiochrome formation, aneurin solution is added to a mixture of acid sulphanilic acid and alkaline $NaNO_2$ (*a*) without, (*b*) with, previous treatment with $K_3Fe(CN)_6$. Colour is determined (electrophotometer) 30 sec. after mixing and thereafter at 15-sec. intervals to a total of 1½—2 min. Max. absorption is attained at ½—1 min., when (*a*) − (*b*) is proportional to the concn. of aneurin. $K_3Fe(CN)_6$ does not influence the slow colour production by histidine, histamine, and tyrosine, and (*a*) − (*b*) can again be used for determining aneurin in presence of these. With similar treatment, the colour production by cocarboxylase is less intense than by aneurin, though the kinetics are the same with the same inhibition by $K_3Fe(CN)_6$; the loss of sensitivity with cocarboxylase can be reduced by preliminary enzymic hydrolysis. The method can conveniently be applied to the determination of aneurin in yeast extract, dried yeast

(involving extraction with acetic acid), and adsorption products. I. A. P.

Determination of lactoflavin in natural products. G. LUNDE, H. KRINGSTAD, and A. OLSEN (Z. physiol. Chem., 1939, **260**, 141—147; cf. A., 1938, III, 1025).—Lactoflavin (not less than 50—60 μg.) is extracted from the products by successive treatment with hot 96% and 70% alcohol. In the authors' method interference by impurities resistant to oxidation with $KMnO_4$ in acetic acid is avoided by reducing the lactoflavin with a trace of $Na_2S_2O_4$ in neutral or slightly alkaline solution to colourless dihydrolactoflavin, the light absorption by the solution being measured before and after the reduction. Except for wheat germ, for which the biological method gives results much higher than those obtained by the chemical method, the results agree well with those of the biological method. The results of other chemical methods are less accurate. W. McC.

Effect of nicotinamide on experimental pellagra in dogs. O. FITZGERALD (Z. Vitaminforsch., 1939, **9**, 62—70).—Whilst nicotinamide has a definite prophylactic action when mixed with a pellagra-producing diet, no significant curative action is observed in dogs suffering from mild or severe pellagra. F. O. H.

Nicotinic acid content of the blood of mammalia. P. B. PEARSON (J. Biol. Chem., 1939, **129**, 491—494).—Modifications in Swaminathan's method (B., 1938, 974) are described. Dog, pig, sheep, and horse blood contain 0·52, 0·47, 0·83, and 0·53 mg.-% of nicotinic acid respectively, which exists almost entirely in the erythrocytes. Little variation was observed in sheep fed on a low-nicotinic acid diet but a low val. was obtained for a dog suffering from black-tongue. H. G. R.

Determination of nicotinamide in blood. A. QUERIDO, A. LVOV, and C. LATASTE (Compt. rend. Soc. Biol., 1939, **130**, 1580—1584).—The technique using a growth test with *B. proteus* is described. H. G. R.

Nicotinamide content of blood. A. QUERIDO, M. ALBEAUX-FERNET, and A. LVOV (Compt. rend. Soc. Biol., 1939, **131**, 182—185).—31 patients with chest, heart, blood, skin, or nervous diseases had normal blood-nicotinamide content. Of 9 cases with liver disease those with cirrhosis or cancer had normal vals.; a case of alcoholic polyneuritis had normal vals., in spite of abnormal vitamin-B_1 saturation. 2 cases of acute icterus had subnormal vals. P. C. W.

Determination of nicotinic acid and its amide in urine, tissues, and blood. K. RITSERT (Klin. Woch., 1939, **18**, 934—936).—A modification of the BrCN–aniline method is described. The nicotinic acid content of human blood was 330—460 μg.-%, of urine 50—300 μg.-%. E. M. J.

Vitamin-B_6 as a yeast nutrilite. R. E. EAKIN and R. J. WILLIAMS (J. Amer. Chem. Soc., 1939, **61**, 1932).—Vitamin-B_6 stimulates growth of yeast. R. S. C.

Vitamin-B_6, a growth-promoting factor for yeast. A. S. SCHULTZ, L. ATKIN, and C. N. FREY (J. Amer. Chem. Soc., 1939, **61**, 1931).—Cryst. vitamin-B_6 is as potent a bios factor for yeast of type *A* or *B* as is nicotinic acid. R. S. C.

Vitamin-B_6. Synthesis of 3-methoxy-2-methyl pyridine-4 : 5-dicarboxylic acid.—See A., 1939, II, 487.

Evidence of another factor in [vitamin-]*B* complex for rats. W. R. WYATT (Proc. Soc. Exp. Biol. Med., 1939, **40**, 281—283).—In addition to vitamin-B_1, flavin, nicotinic acid, and -B_6, young rats require factors contained in lucerne and rice polishings extracts respectively to maintain their growth. V. J. W.

Structure of the chick antidermatitis factor. D. W. WOOLLEY, H. A. WAISMAN, and C. A. ELVEHJEM (J. Biol. Chem., 1939, **129**, 673—679; cf. A., 1939, III, 704).—The chick antidermatitis factor is easily hydrolysed by acid or alkali with loss of activity. It is composed of β-alanine joined by a peptide link to a hydroxy-acid. The latter easily forms a lactone, indicating OH γ or δ to the carboxyl. The growth factor for yeast described by Williams *et al.* (cf. A., 1933, 982) has similar properties and is probably identical. E. M. W.

Hypervitaminosis-*C* in the rabbit. J. Z. SCHNEIDER and K. WILLERT (Chem. Listy, 1939, **33**, 249—251).—The growth curves are unaffected by feeding excess of vitamin-*C*. The wt. of the thyroid and testes is unchanged, that of the adrenals and the spleen lowered, and of the pancreas and submaxillary glands raised, by high-*C* diets. R. T.

Anaphylactic shock and vitamin-*C* saturation. F. DIEHL (Klin. Woch., 1939, **18**, 956—960).—Anaphylactic shock was more severe in *C*-hypovitaminous guinea-pigs than in avitaminous or normal animals. Thyroxine increases the shock even in animals with normal or high -*C* level. E. M. J.

New test for hypovitaminosis-*C*. P. WÖRDEHOFF (Klin. Woch., 1939, **18**, 984).—Ascorbic acid oxidase destroyed the reducing substances of plasma completely when its concn. exceeded 0·3—0·4 mg.-%, otherwise a non-destroyable reducing substance remained equiv. to 0·08—0·25 mg.-% of ascorbic acid. E. M. J.

Intramuscular use of monoethanolamine salt of ascorbic acid in patients with vitamin-*C* deficiency. E. L. LOZNER, F. J. POHLE, and F. H. L. TAYLOR (New England J. Med., 1939, **220**, 987—989).—This is a simple, safe, and effective method of parenteral administration of vitamin-*C*. A. M. G.

Effect of ascorbic acid on isolated uterus of guinea-pig and rat. A. GALAMINI and M. T. MINOZZI (R. Ist. San. Pubbl., 1939, **2**, 289—311).—Ascorbic acid (in physiological saline) increases tonus and reduces amplitude of contraction of the isolated uterus. The effects of simultaneous addition of eserine, nicotine, adrenaline, etc. indicate that ascorbic acid acts on the uterine muscle and, to a greater extent, on the parasympathetic innervation. F. O. H.

Vitamin-*C*, callus formation, and hyperæmia. E. W. LEXER (Arch. klin. Chir., 1939, **195**, 611—

625; cf. A., 1939, III, 704).—Callus formation and hyperæmia were investigated in fractures of the left femur, carried out in guinea-pigs weighing 180—250 g. under ether narcosis. 34 animals given a diet lacking in vitamin-*C* for short and long periods before and after the fracture showed much less reactive vascular fullness than 19 animals on a normal diet; hyperæmia is the less the greater are the scorbutic phenomena. Regression of callus formation was demonstrated histologically, connective tissue predominating in proportion to the degree of *C*-avitaminosis. When normal food days were interspersed, hyperæmia and regenerative processes increased. In 20 animals with a diet containing additional -*C*, hyperæmia ensued more rapidly and lasted longer, while callus formation was plentiful, but less firm than in normal animals. B. W.

Vitamin-*C* and toxins. III. Effect of diphtheria toxin on vitamin-*C* metabolism. B. Ghosh (J. Indian Chem. Soc., 1939, **16**, 241—246; cf. A., 1938, III, 598, 1055).—In guinea-pigs, blood-, adrenal-, liver-, and kidney-ascorbic acid are diminished on the 2nd, 3rd, and 4th days after injection of half the min. lethal dose of diphtheria toxin. In the urine free ascorbic acid is diminished and ascorbigen (determination described) is increased. J. L. D.

Effect of nicotine on threshold of vitamin-*C*. L. H. Strauss and P. Scheer (Z. Vitaminforsch., 1939, **9**, 39—48).—The urinary excretions of vitamin-*C* (and of -B_1) by normal men receiving doses above the "saturation" level are reduced by smoking (1—3 cigarettes), due to increased endocrine (thyroid and adrenal) and sympathetic nervous activity. F. O. H.

Effect of vitamin-*C* on lead poisoning. H. N. Holmes, K. Campbell, and E. J. Amberg (J. Lab. clin. Med., 1939, **24**, 1119—1127).—Administration of 100 mg. of vitamin-*C* daily to each of 34 Pb workers improved their general health and blood counts, and symptoms of chronic Pb poisoning usually disappeared. In 3 workers specially studied -*C* administration lowered the urinary excretion of Pb. C. J. C. B.

Vitamin-*C* synthesis and excretion by the rat. R. R. Musulin, R. H. Tully, 3rd, H. E. Longenecker, and C. G. King (J. Biol. Chem., 1939, **129**, 437—444; cf. A., 1939, III, 291).—Urinary excretion of vitamin-*C* by rats on a diet of rolled oats, wheat bran, milk powder, butter fat, cod-liver oil, and salt is mainly due to the presence of volatile lipin constituents in the unsaponifiable fraction. Inanition causes a decrease in the excretion rate from approx. 2 to 0·2 mg. per day within 3—4 days, and to 0·05 mg. per day within 5—6 days, whilst a 3-day inanition period followed by a diet of evaporated milk usually causes a rate of approx. 0·2—0·3 mg. per day. The common fatty acids, sterols, proteins, and sugars together with a milk diet do not cause a high -*C* excretion. Vac.-distilled fractions from the unsaponifiable matter of halibut-liver, oat, grass leaf, and lucerne leaf oils cause high excretions. J. N. A.

Acceleration of vitamin-*C* synthesis and excretion by feeding organic compounds to rats. H. E. Longenecker, R. R. Musulin, R. H. Tully, 3rd, and C. G. King (J. Biol. Chem., 1939, **129**, 445—453).—Addition of 50 mg. of a *substance*, b.p. 90°/12 mm. (*semicarbazone*, m.p. 193—194°; *oxime*, m.p. 97°), obtained from the unsaponifiable material from dried lucerne, daily to a basal diet of evaporated milk raises the urinary excretion of vitamin-*C* from 0·3 mg. to 10—15 mg. per day. Terpene-like cyclic ketones are very effective in causing increased -*C* excretion, the more active being *d*- and *l*-carvone, *dl*-piperitone, *iso*phorone, α- and β-ionone, pulegone, thujone, and camphor. Feeding 100 mg. of *d*-carvone per day leads to average excretion vals. of 16·5 mg. of -*C* per day. The saturated alcohols derived from *d*-carvone and *iso*phorone are almost as effective as the unsaturated ketones, whilst the increase is not so marked with menthol, *iso*borneol, cineole, and nerolidol. Di*iso*butyl ketone, dipropyl ketone, and acetyldimethylcarbinol are also relatively active. It is suggested that none of the substances acts as direct precursor of -*C*, but that they stimulate the synthesis of -*C* from intermediary or tissue metabolites. J. N. A.

Ascorbic acid content of tissues. Different forms of ascorbic acid. A. Giroud and E. Géro (Compt. rend. Soc. Biol., 1939, **131**, 494—497).—The ascorbic acid content of various organs (ox) is slightly higher by the indophenol than by the methylene-blue method. This difference increases if the animal (guinea-pig) receives increasing doses of ascorbic acid and is probably die to a reducing substance allied to ascorbic acid. H. G. R.

Determination of ascorbic acid in blood. C. Reiss (Compt. rend. Soc. Biol., 1939, **131**, 522—525).—The chief difficulties are due to instability of ascorbic acid in blood and the methods of Bezssonoff (A., 1936, 1159) and Wahren (A., 1938, III, 598) give the most satisfactory results. H. G. R.

Vitamin-*C* [requirements] of invertebrates. E. Nešpor and K. Wenig (Biochem. Z., 1939, **302**, 73—76).—Determinations by the method of Martini and Bonsignore (A., 1934, 1271) indicate that invertebrates do not require ascorbic acid and usually contain none. The amount of the acid found in the liver of the crab *Potamobius astacus* and in the kidneys and intestine of the snail (*Helix pomatia*) depends on the ascorbic acid content of the diet. W. McC.

[Vitamin-*D* and] metabolic processes in dentine. T. Spreter von Kreudenstein (Klin. Woch., 1939, **18**, 992—993).—Calcification occurs in rachitic epiphyseal cartilage or osteoid tissue when surviving sections of the epiphyses of rachitic rats are brought into Shipley's (cf. Bull. Johns Hopkins Hosp., 1925, **35**, 304) inorg. salt solution; no calcification occurred in the rachitic dentinoid of tooth sections treated in the same way. The result of treatment of living animals with vitamin-*D* was similar. E. M. J.

Effect of vitamin-*D* on experimental anæmia. A. Galamini and A. Pirani (R. Ist. San. Pubbl., 1939, **2**, 103—144).—Administration of vitamin-*D* to rats on a rachitogenic diet increases their resistance to anæmia produced by injection of pyridine. F. O. H.

Chronic experimental rickets. V. EDEL (Compt. rend. Soc. Biol., 1939, **131**, 275—277).—Spontaneous cure of rickets produced in young rats on reaching maturity could not be confirmed. A rachitogenic diet given to adult rats produces bone changes in the diaphysis alone. The same diet given continuously from 20—30 days of age to maturity produced radiological changes in the bones resembling those seen clinically in dystrophic rickets (Mouriquand) and a diminution of the ash content of the bones. P. C. W.

Citrates in treatment of infantile rickets. A. T. SHOHL and A. M. BUTLER (New England J. Med., 1939, **220**, 515—517).—2 cases are reported in which the administration of mixtures of citric acid and Na citrate induced healing without vitamin-*D* therapy. A. M. G.

Value of irradiated evaporated milk in prevention of rickets in premature, weakling, and normal full-term infants. E. W. MAY and T. M. WYGANT (Arch. Pediat., 1939, **56**, 356—374).—Of 51 normal full-term infants fed on irradiated milk none developed rickets, and the linear growth and gain in wt. were better than in 33 full-term infants fed on non-irradiated evaporated milk. 17 of the second group developed rickets by the 7th month. C. J. C. B.

Magnesium and vitamin-*D* relationship in calves fed mineralised milk. C. E. KNOOP, W. E. KRAUSS, and C. C. HAYDEN (J. Dairy Sci., 1939, **22**, 283—289).—Addition of $MgCO_3$ to a ration of a limited amount of winter milk plus Cu and Fe for calves resulted in a normal Mg content in bone and blood-serum. Low vals. were obtained without the Mg supplement. Ultra-violet irradiation (vitamin-*D*) slightly increased bone wt. J. G. D.

Limit of accuracy of A.O.A.C. chick assay for vitamin-*D*. B. L. OSER (J. Assoc. Off. Agric. Chem., 1939, **22**, 445—449).—The results of collaborative analyses of cod-liver oil reported previously (cf. A., 1938, III, 56) are examined statistically. It is estimated that, for these data, the min. significant difference in mean (or composite) bone ash vals. for a group of 10 chicks is 2·73%, and that for 100, 0·86%. E. C. S.

Spectrographic determination of vitamin-*D*. Z. NAKAMIYA and K. TAKIZAWA (Bull. Inst. Phys. Chem. Res. Japan, 1939, **18**, 472—488).—No relationship is found between the extinction coeff. of materials containing vitamin-*D* (*e.g.*, irradiated ergosterol, liver oils) or of the unsaponifiable matter from the materials and the -*D* content biologically determined. The results of spectrographic examination are not appreciably affected by the saponification or by the removal of cholesterol but the saponification results in loss of 20—30% of -*D*. -*A* interferes in the determination of -*D* and should be removed. If -*A* is removed with acid clay some -*D* is also removed. W. McC.

Isolation of α- and β-tocopherols and their derivatives. C. S. MCARTHUR and E. M. WATSON (Canad. Chem., 1939, **23**, 350—352).—The unsaponifiable fraction of wheat-germ oil is mainly freed from sterols and treated with succinic anhydride in pyridine. The H succinic esters are extracted from ether solution by methyl alcohol–Na_2CO_3 and subsequently hydrolysed and converted into allophanates. By this method, 1 kg. of oil yielded 0·90 g. of α- and 0·20 g. of β-tocopheryl allophanate. Neither the tocopherols nor their degradation products could be isolated from 40 gals. of non-pregnant cow's urine. F. O. H.

Vitamin-*E*. Synthesis of tocopherols.—See A., 1939, II, 439.

Colorimetric determination of tocopherol (vitamin-*E*). III. Blood-serum. A. EMMERIE and C. ENGEL (Rec. trav. chim., 1939, **38**, 895—902; cf. A., 1939, II, 236).—Tocopherol is unstable to KOH but stable to HCl. It may be determined in serum by shaking with KOH–formaldehyde–alcohol and extraction with ether; the residue from the ether extract, in benzene, is separated from carotenoids and vitamin-*A* by adsorption of the latter on floridin XS earth (purified by conc. HCl), followed by determination of tocopherol colorimetrically by a dipyridyl–$FeCl_3$ reagent in benzene–alcohol. Administration of tocopherol or its acetyl derivative to -*E*-deficient rats gives an increase in the tocopherol content of the blood serum. In determining acetyltocopherol, the material must be saponified, but recovery of tocopherol is not quant. J. D. R.

Alimentary avitaminosis-*K* in rats. H. DAM and J. GLAVIND [with I. SVENDSEN] (Z. Vitaminforsch., 1939, **9**, 71—74).—Feeding an artificial, vitamin-*K*-free diet produced avitaminosis-*K* (which could be cured by injection of -*K*) in 7 out of 15 rats within 15—80 days (cf. A., 1939, III, 117). F. O. H.

Specificity of vitamin-*K*. R. KUHN, K. WALLENFELS, F. WEYGAND, T. MOLL, and L. HEPDING (Naturwiss., 1939, **27**, 518—519).—1 : 4-Naphthaquinone and various alkyl derivatives possess vitamin-*K* activity, the 2 : 3-dimethyl derivative being especially active and exhibiting curative effects in doses of 0·5 mg. α-Tocopherylquinone (A., 1938, II, 241), though devoid of -*E* activity, exhibits -*K* activity in doses of 10 mg. W. O. K.

Antihæmorrhagic activity of naphthaquinones. H. J. ALMQUIST and A. A. KLOSE (J. Amer. Chem. Soc., 1939, **61**, 1923—1924).—The Na methoxide reaction of phthiocol resembles that of vitamin-*K* concentrates qualitatively and in the position of the adsorption max. -*K* activity is in the increasing order 2-hydroxy-1 : 4-naphthaquinone, phthiocol, phthiocol acetate, 2-methyl-1 : 4-naphthaquinone, all greatly inferior to a lucerne concentrate. Lapochol and lomatiol are inactive. R. S. C.

Simple compounds with vitamin-*K* activity. S. ANSBACHER and E. FERNHOLZ (J. Amer. Chem. Soc., 1939, **61**, 1924—1925).—Vitamin-*K* activity of 2-methyl-1 : 4-naphthaquinone nearly equals that of pure -*K* and slightly exceeds that of its quinol diacetate. Phthiocol is several hundred times less active than -*K*. Duroquinol (1 mg.) is inactive. R. S. C.

Vitamin-*K* activity of some quinones. S. A. THAYER, L. C. CHENEY, S. B. BINKLEY, D. W. MACCORQUODALE, and E. A. DOISY (J. Amer. Chem. Soc.,

1939, **61**, 1932).—The following vitamin-*K* activities (units per mg.; cf. pure -K_1 1000) are reported. 1 : 4-Naphthaquinone 1; 2-methyl- 10, 2-ethyl- 8, 3-hydroxy-2-methyl- 2, and 2-bromo-3-methyl-1 : 4-naphthaquinone above 0·1; 2 : 3-dibromo-1 : 4-diketo-1 : 2 : 3 : 4-tetrahydronaphthalene above 0·1; 1 : 4-diacetoxynaphthalene 0·5 and its 2-methyl derivative 5. Anthraquinone-2-sulphonic acid, thymoquinone, tolu-*p*-quinone, 9 : 10-diacetoxyanthracene, 1 : 2-naphthaquinone, diamylquinol, *p*-xyloquinone, *p*-benzoquinone, and 2-allyl-1 : 4-naphthaquinone are inactive. R. S. C.

Physicochemical concentration of vitamin-*K*. B. Riegel, C. E. Schweitzer, and P. G. Smith (J. Biol. Chem., 1939, **129**, 455—504).—Vitamin-*K* (from lucerne) can be conc. in a mol. still or by adsorption on fuller's earth without loss of activity. Carnaubyl alcohol and α-spinasterol have been isolated in the inactive fraction. No functional groups other than unsaturation have been observed. H. G. R.

Vitamin-*P*. H. Scarborough (Biochem. J., 1939, **33**, 1400—1407).—Among the products tested was a colourless *flavanone* prep., m.p. 255—256°, obtained from Californian Valencia oranges. This, when administered intramuscularly to man in doses of 50—100 mg. daily, increased the resistance of the capillary walls to pressure. A similar active substance (not ascorbic acid) was also present in lemon juice. These substances are also active when administered orally. P. G. M.

Simplified rations for guinea-pigs suitable for assay of the grass juice factor. G. O. Kohler, S. B. Randle, C. A. Elvehjem, and E. B. Hart (Proc. Soc. Exp. Biol. Med., 1939, **40**, 154—157).—Certain diets which are adequate for rats cause failure of growth and death in the guinea-pig unless supplemented by dried but not autoclaved grass. A further factor, contained in oats, is needed to prevent the occurrence of gastric ulcers. V. J. W.

(xix) METABOLISM, GENERAL AND SPECIAL.

"Basal metabolism." I. "Basal metabolism" and amino-acids. C. Oehme (Biochem. Z., 1939, **302**, 12—41; cf. A., 1937, III, 277).—In guinea-pigs, rats, and rabbits on certain diets, basal metabolism (O_2 consumption) is decreased by long-continued administration of non-toxic doses of glycine, alanine, *l*(+)-leucine, *l*(−)-tyrosine, *dl*-phenylalanine, *l*(−)-hydroxyproline, and *l*(+)-glutamic acid although wt. and health are not affected. The action of glycine is only partly or not at all counteracted by administration of benzoate. Basal metabolism is increased by administration of *l*(+)-valine, arginine, *l*(+)-tryptophan, *l*-(−)-histidine, and (probably) *dl*-lysine. The effects persist for long periods after administration of amino-acid ceases. Combinations of several of the acids which decrease the metabolism have no greater effect than have the individual acids but effects are counteracted when an acid which reduces and one which increases basal metabolism are given together. Basal metabolism is not affected by long-continued administration of glucose, Na lactate, Na pyruvate, palmitic acid, $NaHCO_3$, or glycerol but is reversibly decreased by that of choline and increased by that of glyceraldehyde, Na hexose diphosphate, and Na phytin. The action of the amino-acids is, in part, affected by the nature of the diet, especially by the amino-acids which it contains. Thus glycine increases basal metabolism when the diet is rich in glycine and decreases it when the diet is poor in glycine although the effects of such diets are partly counteracted by greatly increasing the dose of glycine. When the diet is free from tryptophan, basal metabolism is not decreased by administering this acid. When the diet is free from hydroxyproline administration of this acid has no effect on or decreases basal metabolism. As regards their effect on basal metabolism, amino-acids are divided into two groups according as the basal metabolism decreases or does not decrease when, with the diet free from or poor in the amino-acid concerned, this acid is administered. Amino-acids not synthesised by the organism largely constitute the second group. The R.Q. increases when the basal metabolism decreases and decreases when it increases, possibly because the administration of amino-acids affects such processes as replacement of fat by carbohydrate in the organism. W. McC.

Effect of bone fracture on metabolism of rat. D. P. Cuthbertson, J. L. McGirr, and J. S. M. Robertson (Quart. J. Exp. Physiol., 1939, **29**, 13—25).—Fracture of the femur of the rat caused loss of N, S, P, K, and creatinine in the urine, Na and creatine remaining const. The results are not due to the anæsthetic, the incision of skin and muscle, or loss of muscle from the site of the injury or wastage of the injured limb. There is a general increase in catabolism. Additional carbohydrate has a sparing effect on the general loss of tissue substance but does not prevent the local wastage. There is a loss of $K^{\cdot}$ from the injured limb in excess of the loss of N. If the increased N in the urine comes from muscle, the loss of tissue can account for $\frac{1}{8}$ of the total loss in body-wt. It is presumed that the rest of the loss in body-wt. consists of the reserves of carbohydrates and fat. T. S. G. J.

Effect of phosphorus deficiency on protein and mineral metabolism of sheep. S. Morris and S. C. Ray (Biochem. J., 1939, **33**, 1209—1216).—The urinary N output was increased in periods of P deficiency and when a diet with an abnormally high Ca : P ratio was fed, although the food intake was lower. The exogenous N metabolism was unaffected while the endogenous metabolism, as shown by lowered creatine, uric acid, purine base, and S content of urine, was diminished by a P-deficient diet. In the P-deficient periods there were losses of both Ca and P which were remedied by addition of a supplement of P. The proportion of total Ca excreted found in the urine rose in the P-deficient periods from 0·5 to 5·0%. C. D. P.

Fasting metabolism of ruminants. S. Morris and S. C. Ray (Biochem. J., 1939, **33**, 1217—1230).—The daily urinary N excretion per kg. body-wt. was 0·06—0·08 g. for cows, 0·12—0·20 g. for goats, and 0·12—0·16 g. for sheep. The daily fæcal N outputs

were 6·6 g., 0·35—0·50 g., and 0·49—0·80 g., respectively. Preformed creatinine diminished slightly during the fast, whilst the creatine rose markedly. The purine metabolism showed a fall in uric acid and allantoin output but an increase in that of purine base. Both protein- and non-protein-N fractions of blood showed an increase. A marked increase in blood-uric acid was noted. No catabolism of osseous tissue occurred even in the 12-day fast. C. D. P.

Excretion of glyoxalinyl compounds and intermediary metabolism of amino-acids at high altitude. K. LANG (Biochem. Z., 1939, **301**, 362—367).—In man, passage from near sea-level to an altitude of 2900 m. results in a decrease (lasting for several days) in the urinary excretion of glyoxalinyl compounds. Passage to 4560 m. causes increase in the urinary output of compounds pptd. by H_2SO_4 and approx. 100% increase in the output of glyoxalinyl compounds, but does not result in excretion of free histidine or in alteration in the proportions of kynurenine and cystine excreted. Probably the increased output of glyoxalinyl compounds is a passing phase due to increased degradation of the proteins of the body at high altitude and not to muscular exertion. Probably no appreciable change in the intermediary metabolism of amino-acids occurs at high altitude. W. McC.

Fate of *ON*-dimethyltyrosine in the rabbit and dog.—See A., 1939, II, 487.

Distribution of sulphur compounds in organism of animals on diets with added sulphur-containing amino-acids. A. GALAMINI (R. Ist. San. Pubbl., 1939, **2**, 61—102).—Data for total, lipin-, alcohol- and water-sol. ash-, and protein-S contents of tissues of rats on a diet poor in S-containing amino-acids are tabulated. Some organs, *e.g.*, brain, pancreas, liver, and muscle, readily store S when the diet contains added methionine etc., whilst others, *e.g.*, bone, spleen, and thymus, diminish in S content. The proteins of adrenal and pancreas gland contain more S than do those of other organs and tissues. Protein-S is the S fraction of greatest importance in the metabolism of uterus and muscle, whilst the water-sol. ash-S is a criterion of catabolism of org. S. Variations in lipin-S appear to be related to protein catabolism. F. O. H.

***p*-Bromophenol as intermediate in synthesis of *p*-bromophenylmercapturic acid from bromobenzene in the rat.** J. A. STEKOL and H. H. DASH (Proc. Soc. Exp. Biol. Med., 1939, **40**, 261—263).—*p*-Bromophenol causes an increased urinary excretion of ethereal sulphates but not of neutral S or of *p*-bromophenylmercapturic acid. Bromobenzene increases neutral S which could be due to *p*-bromophenylmercapturic acid. V. J. W.

Radioactive sulphur for biochemical experiments.—See A., 1939, I, 532.

Metabolism of fructose. A. B. CORKILL and J. F. NELSON (Austral. J. Exp. Biol., 1939, **17**, 205—213).—With spinal eviscerated cat preps., fructose injected could be quantitatively accounted for unchanged in the muscles and blood. Fructose is thus not appreciably utilised by the muscles. Insulin has no effect. No increase in blood-lactate follows injection of moderate amounts of fructose; with larger amounts, a rise occurs. D. M. N.

Fructose tolerance in various forms of psychoses. K. YUKI (Fukuoka Acta Med., 1939, **32**, 42).—In schizophrenics the max. blood-sugar val. is higher than in healthy persons, but the curve is otherwise normal. Manic depressives and patients with general paralysis of the insane exhibit a tendency toward a prolongation of the high blood-sugar following the test. In tabes dorsalis, morphinism, alcoholism, and senile dementia, the blood-sugar rises to a very high level, but the curves are otherwise unremarkable. W. D'A. M.

Metabolism of *d*- and *l*-xylulose in the depancreatised dog. H. W. LARSON, W. H. CHAMBERS, N. R. BLATHERWICK, M. E. EWING, and S. D. SAWYER (J. Biol. Chem., 1939, **129**, 701—708).—When 5 g. of *l*-xylulose was given intraperitoneally or orally to a depancreatised dog the urine contained 27% and 36% of non-fermentable sugar respectively. 2·7—3·3 g. of "extra" glucose were excreted, indicating that *l*-xylulose was converted to glucose. Similar results were obtained with *d*-xylulose. E. M. W.

Parenteral administration of glucose. F. AXMACHER and E. FUNKE (Klin. Woch., 1939, **18**, 984—987).—50% solutions of glucose were injected subcutaneously into rabbits; increased dosage led to a protracted blood-sugar max.; divided dosage (given simultaneously at different places) led to higher max. vals.; the max. were reached at the same time also with a concn. of only 25%. No starch effect was observed with repeated injections. E. M. J.

Disturbances of carbohydrate metabolism in diseases of biliary system. W. STOKINGER (Dtsch. Z. VerdauKr. Stoffw., 1939, **2**, 86—99).—The "lag curve" of the glucose tolerance test was observed in a no. of cases of infection of the biliary passages or in cholelithiasis, but not in pancreatic diabetes. E. M. J.

Diabetic children on unrestricted diet. K. BOJLÉN (Acta Pædiat., Stockh., 1937, **20**, 310—336).—16 diabetic children (average age 11 months to 10 years) were given an unrestricted diet and insulin for 2 years or more. 7 were perfectly well, the rest almost so. Coma or precoma occurred only in 3. Blood- and urine-sugar remain at a high level. 1 patient had ketosis. A. J. B.

Treatment of gout with low-fat high-carbohydrate diet. E. C. BARTELS (New England J. Med., 1939, **220**, 583—586).—Good results were obtained in 4 cases. A. M. G.

Vitamin-*C* and alkaptonuria. C. J. DÍAZ, H. C. MENDOZA, and J. S. RODRÍGUEZ (Klin. Woch., 1939, **18**, 965—966).—A ketogenic diet, a carbohydrate-free diet, or the administration of liver extract had no effect on the excretion of homogentisic acid in an alkaptonuric; vitamin-*C*, however, given with a ketogenic diet stabilised the acid in such a way as to prevent spontaneous blackening of the urine and the staining of linen. E. M. J.

Combined carbohydrate in the blood and glycolysis. C. DUMAZERT and G. PENET (Compt. rend. Soc. Biol., 1939, **131**, 375—378).—Glycolysis of free sugar is accompanied by simultaneous disappearance of the protein-bound sugar liberated by hydrolysis by acetic acid and a transient increase in sugar liberated by hydrolysis by H_2SO_4. H. G. R.

Ketosis. XVI. Metabolism of α-, β-, and βγ-deuterobutyric acids in the fasting rat. M. G. MOREHOUSE (J. Biol. Chem., 1939, **129**, 769—779).—D may be used to trace the source of the urinary ketones. Approx. 25% of the urinary β-hydroxybutyric acid originating from ingested βγ-deuterobutyric acid retains D. P. G. M.

Rôle of glucose 1-phosphate in the formation of blood-sugar and synthesis of glycogen in the liver. G. T. CORI, C. F. CORI, and G. SCHMIDT (J. Biol. Chem., 1939, **129**, 629—640).—Rabbit's blood has a lower diastase content than that of dogs, guinea-pigs, and rats. In the presence of phosphate and adenylic acid, glycogen is converted by extracts of rabbit's liver into hexose monophosphate and fermentable sugar. The phosphorylase, responsible for the formation of hexose monophosphate, is separated from the phosphatase, which converts this phosphate into sugar, by adsorption on $Al(OH)_3$, elution with glycerophosphate, and pptn. with $(NH_4)_2SO_4$. Addition of glucose 1-phosphate to this enzyme prep. in presence of adenylic acid produces a polysaccharide indistinguishable from glycogen. At equilibrium of the reaction glycogen + $H_3PO_4 \rightleftarrows$ glucose 1-phosphate, the ratio of concn. of inorg. phosphate to concn. of glucose 1-phosphate is 5·1 at 30°. E. M. W.

Phosphorylation of riboflavin by intestinal mucous membrane. R. PULVER and F. VERZÁR (Enzymologia, 1939, **6**, 333—336; cf. A., 1938, III, 1050).—Intestinal mucous membrane powder phosphorylates riboflavin in PO_4''' buffer at p_H 7·2, 83% of the flavin migrating to the anode during cataphoresis. Phosphorylation is irreversibly inhibited by 0·02% of phloridzin. 0·01% of KCN or 0·25—0·5% of iodoacetic acid also inhibits, but activity is restored by washing or dialysis. NaF is inactive. The phosphatase does not lose its activity after dialysis, but is destroyed by pepsin. Phosphorylation also occurs in absence of O_2. J. N. A.

Factors influencing formation of Robison ester. H. LEHMANN (Biochem. J., 1939, **33**, 1241—1244).—Robison-ester formation is inhibited by SS-glutathione (reversed by SH-glutathione), alloxan (partly reversed by SH-glutathione), caffeine, and Zn, and is increased by SH-glutathione. Cori-ester formation is unaffected by SH- and SS-glutathione and Zn but is inhibited by alloxan and caffeine at concns. higher than 0·01M. Co acts on Robison ester formation like SH-glutathione but at a much lower concn. and can remove SH groups from washed muscle brei. H. G. R.

Decomposition of diphosphoglycerate in acidified blood. Relationship to reactions of glycolytic cycle. S. RAPOPORT and G. M. GUEST (J. Biol. Chem., 1939, **129**, 781—790).—Regulation of the concn. of diphosphoglycerate in blood cells is a function of the glycolytic cycle, in that it supplies PO_4''' for rephosphorylation of adenylic acid which has been hydrolysed. P. G. M.

Electrolyte and water balance. A. M. BUTLER (New England J. Med., 1939, **220**, 827—834).—A review. A. M. G.

Effect of porphyrin on the metabolism of warm-blooded animals. II. K. HINSBERG and R. MERTEN (Biochem. Z., 1939, **302**, 103—111; cf. A., 1939, III, 379, 498).—In rabbits during a period of two months, daily intramuscular injection of hæmatoporphyrin causes increase in the hæmoglobin and bound sugar contents of the blood, in total serum-protein, and, later, in -residual and -amino-N. The free sugar, uric acid, and lactic acid contents are not affected. The total C, total N, and urea contents of the urine and the urinary C : N ratio are also increased but the amino-N content is increased only in proportion to the increase in total N excretion; the uric acid content is unaffected. Hæmatoporphyrin increases metabolism generally and reversibly inhibits oxidations in the organism. Protoporphyrin produces similar changes in blood and urine but does not affect the urinary C : N ratio; it appears to stimulate oxidations in the body. Possible relationships between the actions of porphyrins and the pituitary hormones are discussed. W. McC.

Production from porphobilinogen of uroporphyrin and porphobilin in acute porphyrinuria. J. WALDENSTRÖM and B. VAHLQUIST (Z. physiol. Chem., 1939, **260**, 189—209).—Colourless porphobilinogen is insol. in org. solvents. It is obtained from the urine of persons suffering from acute porphyrinuria, in which it is accompanied by porphobilin, by chromatographic adsorption, elution with aq. NH_3, readsorption on Al_2O_3, and elution again with aq. NH_3. It is purified by electrophoresis, is amphoteric, and has isoelectric point p_H 4·1 and mol. wt. approx. 350. Probably it is a dipyrryltetracarboxylic acid. Boiling in acid medium converts it into red porphobilin (which has mol. wt. approx. 750—800 and a spectrum identical with that of urobilin), uroporphyrin III, and probably a very small proportion of uroporphyrin I. Boiling alkali converts porphobilinogen into a colourless substance not identical with but having a spectrum similar to that of urobilinogen. This substance is probably identical with that obtained from porphobilin by reduction with Na–Hg. Porphobilin is esterified when adsorbed on Al_2O_3, dried, and treated on the adsorbent with methyl alcohol saturated with HCl. The tissues of persons suffering from acute porphyrinuria contain porphobilinogen but probably never uroporphyrin. W. McC.

Production of β-3-hydroxy-6-keto*allo*cholanic acid from 3 : 6-diketocholanic acid in the toad and from α-3-hydroxy-6-ketocholanic acid in the rabbit. M. TUKAMOTO (Z. physiol. Chem., 1939, **260**, 210—216).—The urine of toads to which 3 : 6-diketocholanic acid and that of rabbits to which α-3-hydroxy-6-ketocholanic acid is administered contains β-3-hydroxy-6-keto*allo*cholanic acid but no α-3 : 6-dihydroxy- or α-3-hydroxy-6-keto*allo*-cholanic acid, respectively. The rabbit's urine contains also deoxy-

cholic acid. Thus α-OH at $C_{(3)}$ undergoes epimerisation and cholanic is converted into *allo*cholanic acid derivative, the product of the transformation being rejected by the organism. W. McC.

Urinary elimination of vagotonin-like substance after administration of vagotonin. C. Franck, R. Grandpierre, and E. Stankoff (Compt. rend. Soc. Biol., 1939, **131**, 324—326).—Intravenous administration of large doses of vagotonin to chloralosed dogs is followed by excretion of a substance pptd. by LiCl and having the properties of vagotonin. H. G. R.

(xx) PHARMACOLOGY AND TOXICOLOGY.

Use of sulphonamides and their derivatives in treatment of gonococcal rheumatism. R. J. Weissenbach and P. Temime (Rev. Méd., 1939, **56**, 240—247).—A review. H. B. C.

Influence of prontosil on experimental *B. coli* infection of mice. A. Helsper (Zentr. Bakt. Par., I, 1939, **143**, 359—367).—Prontosil added to culture media in concns. of 1 : 10,000 has no bactericidal effect and does not prevent or delay death when given subcutaneously to mice infected with *B. coli*. The cause of the discrepancy between the clinical and experimental results is discussed. G. W.

Effect of sulphanilamide on experimental *Pasteurella avicida* infection. D. M. Cardoso, J. Reis, and P. Nobuga (Compt. rend. Soc. Biol., 1939, **131**, 309—310).—Administration of sulphanilamide protects fowls against the effects of *P. avicida* infection. P. C. W.

Effect of *p*-aminobenzenesulphonamide (1162 F.) on experimental infection in *Galleria mellonella*. V. Zernoff and J. Ajolo (Compt. rend. Soc. Biol., 1939, **131**, 232—234).—1162 F. has a protective and curative action against staphylococcus and *B. paratyphosus*-B infection in the caterpillars of *G. mellonella*. P. C. W.

Optimum dose of sulphanilamide for guinea-pigs. A. R. Armstrong, J. L. Thompson, and A. R. Thomas (J. Lab. clin. Med., 1939, **24**, 1203—1205).—200-mg. doses at 4 hr. intervals by stomach tube maintain the free blood-sulphanilamide at a level exceeding 10 mg.-%. C. J. C. B.

Case of meningococcal meningitis treated with soluseptasine, sulphonamide, and serum. R. A. Bennett (J. R.A.M.C., 1939, **72**, 54). A. J. B.

Chemotherapy of experimental type II pneumococcic meningitis. P. Gross, F. B. Cooper, and M. Lewis (Amer. J. med. Sci., 1939, **197**, 609—617).—Sulphanilamide therapy produced a marked reduction in mortality as well as in incidence of severity of the lesions in experimental cerebrospinal meningitis produced in rats with a type II pneumococcus. R. L. N.

Concentration of sulphanilamide in spinal fluid and blood following single intrathecal injection of drug. E. Neter, D. H. Weintraub, and A. L. Dayman (Proc. Soc. Exp. Biol. Med., 1939, **40**, 164—166).—Concn. in c.s.f. is high for at least 4 hr. after injection but the drug is eliminated in 18—24 hr. V. J. W.

Determination of sulphanilamide in tissue, urine, and blood. F. T. Maher and W. J. R. Camp (J. Lab. clin. Med., 1939, **24**, 1198—1203).—A modification of Marshall's method is described in which $AgNO_3$ is used to remove interfering substances, especially Cl. Ephedrine, adrenaline, guanidine, and other amino-compounds interfere with this test. C. J. C. B.

Determination of uleron. W. Lutz (Klin. Woch., 1939, **18**, 996—997).—Hecht's method was modified by filtration at the end of the test, which then allows direct measurement in the step-photometer. E. M. J.

Mode of action of sulphanilamide *in vitro*. C. A. Chandler and C. A. Janeway (Proc. Soc. Exp. Biol. Med., 1939, **40**, 179—184).—Organisms previously grown in sulphanilamide are rapidly inhibited in fresh media containing it, whereas normal organisms multiply at the usual rate for several hr. This increased susceptibility can be partly removed by washing. Immune rabbit serum and sulphanilamide together are more bactericidal than either alone. V. J. W.

Effect of sulphanilamide on electrode potential of hæmolytic streptococcal cultures. C. L. Fox, jun., B. German, and C. A. Janeway (Proc. Soc. Exp. Biol. Med., 1939, **40**, 184—189).—Potential is raised during bacteriostasis but falls when active growth begins. V. J. W.

Liver function and treatment with sulphanilamides. W. Schmidt (Klin. Woch., 1939, **18**, 953—956).—Treatment with sulphanilamides had no deleterious effect on liver function in 29 cases; lowered liver function caused by infections was restored by the treatment. E. M. J.

Importance of bile for absorption and excretion of uleron. W. Lutz (Klin. Woch., 1939, **18**, 967—969).—Only min. amounts of the sulphanilamides DB 87 and DB 90 (uleron) given were found in the blood and urine of jaundiced patients, especially in obstructive jaundice. Uleron is sol. in presence of bile salts. The high uleron content of fæces is caused by its excretion in bile, as could be shown in dogs with biliary fistulæ. E. M. J.

Influence of sulphanilamide and related compounds on oxidation-reduction potentials of hæmolytic streptococcus. J. Warren, J. A. Street, and H. E. Stokinger (Proc. Soc. Exp. Biol. Med., 1939, **40**, 208—212).—1 in 10,000 sulphanilamide raises the potential by 80—100 mv. after about 10 hr. This effect does not occur under anaërobic conditions or in cysteine broth, or in the case of compounds which are not bacteriostatic. V. J. W.

Toxicity of 2-sulphanilylamidopyridine and di-*p*-acetamidophenyl sulphone. H. Molitor and H. Robinson (Arch. int. Pharmacodyn., 1939, **62**, 281—294).—Dagenan, or sulphapyridine, and rodilone are much less toxic to rats, mice, etc. by oral administration than sulphanilamide. Rodilone on repetition caused pronounced cyanosis and dagenan in large

doses caused uroliths in rats, rabbits, and monkeys, but not in mice and dogs. The uroliths consisted of the acetyl derivative of dagenan. D. T. B.

Comparison of *p*-sulphanilamidoacetophenone and sulphanilamide. H. MÖLLER (Arch. exp. Path. Pharm., 1939, **192**, 708—714).—Sulphanilamidoacetophenone is considerably less toxic by mouth in rats, mice, and cats than sulphanilamide. The rate of excretion of the two substances in the urine (dog) is about the same. H. BL.

Chemotherapy of inguinal lymphogranulomatosis. C. LEVADITI, A. VAISMAN, and L. REINIÉ (Compt. rend. Soc. Biol., 1939, **131**, 40—42).—The sulphamide derivative No. 33 of Girard exhibits chemotherapeutic activity *per os* in mice and monkeys and is tolerated at a dose of 20 mg. per g. for the former and 0·5 g. per kg. for the latter. H. G. R.

Concentration of sulphonamide derivatives in nervous centres after prolonged absorption. M. RISER and P. VALDIGUIÉ (Compt. rend. Soc. Biol., 1939, **130**, 1173—1175).—After repeated doses of sulphonamide derivatives, uniform distribution (with slight variations) in the various organs of the dog occurs. H. G. R.

Cerebrospinal fever treated with M. & B. 693. W. H. OSBORN (Brit. Med. J., 1939, I, 1281—1282).—3 successful cases are recorded. C. A. K.

M. & B. 693 in meningococcal meningitis. W. J. ROCHE and C. J. MCSWEENEY (Brit. Med. J., 1939, I, 1278—1281).—10 out of 11 cases of meningococcal meningitis were successfully treated with M. & B. 693. Previously, 36 cases treated with serum and spinal drainage showed a mortality rate of 75%, and the introduction of sulphanilamide in 56 cases had lowered this to 57%. C. A. K.

Pneumococcal meningitis treated with M. & B. 693. (A) J. D. AITCHISON. (B) J. H. DOWDS. (C) H. DUNLOP and J. LAURIE (Lancet, 1939, **236**, 1436, 1436—1437, 1437).—Two unsuccessful (A and B) and one successful (C) cases are recorded. C. A. K.

Treatment of lobar pneumonia with sulphapyridine. M. CUTTS, C. F. GORMLY, and A. M. BURGESS (New England J. Med., 1939, **221**, 263—266).—In 44 cases treated with sulphapyridine only, the mortality was 2%; 22 cases were given serum alone, the mortality being 9%; 13 cases had both sulphapyridine and serum and 23% died. A. M. G.

Sulphapyridine in treatment of lobar and broncho-pneumonia in infants and children. J. M. DOBBINS, H. RAPPAPORT, and M. A. BRESCIA (Arch. Pediat., 1939, **56**, 375—383).—27 cases were treated with 1 death. In 2 cases the pneumonic process spread while under treatment with sulphapyridine. C. J. C. B.

Sulphapyridine (dagenan) and experimental poliomyelitis. J. A. TOOMEY and W. S. TAKACS (Arch. Pediat., 1939, **56**, 384).—In 8 monkeys sulphapyridine had no prophylactic effect against poliomyelitis. C. J. C. B.

Effects of anæsthetic drugs on rats treated with sulphanilamide. J. ADRIANI (J. Lab. clin. Med., 1939, **24**, 1066—1071).—White rats treated with 0·5—1·0 mg. per g. body-wt. reacted normally to $CHCl_3$, ether, N_2O, *cyclo*propane, CO_2 excess, O_2 want, and avertin. With evipan, pentothal, thioethamyl, amytal, or nembutal, sub-anæsthetic doses became anæsthetic and often lethal. This effect was less intense early in sulphanilamide therapy and more intense with increased dosage of the drug, whilst the effect disappeared 4 days after the sulphanilamide was stopped. C. J. C. B.

Effect on bacteriophage of prontylin, prontosil, sulphapyridine, and other antiseptics and dyes used in surgical practice. H. ZAYTZEFF-JERN and F. L. MELENEY (J. Lab. clin. Med., 1939, **24**, 1017—1026).—Ordinary general antiseptics cannot be used with bacteriophage in the treatment of mixed infections, but sulphapyridine and sulphanilamide can be so used. C. J. C. B.

Attempt to prepare some new antimalarial compounds. N. S. DROZDOV and V. I. STAVROVSKAJA (Compt. rend. Acad. Sci. U.R.S.S., 1939, **23**, 61—63).—A no. of compounds, several of them derivatives of *p*-aminobenzenesulphonamide, have been prepared and found ineffective against malaria of birds. E. M. W.

Amidines and amidoximes with trypanocidal activity.—See A., 1939, II, 471.

Cinchona alkaloids in pneumonia. Amyl and hydroxyalkyl *apo*cupreine ethers.—See A., 1939, II, 457.

Determination of quinacrin [atebrin] in blood. C. LATASTE, N. VAN LIEN, and E. FARINAUD (J. Pharm. Chim., 1939, [viii], **29**, 577—582).—The sample is heated with an equal vol. of 60% KOH at 100° for 3—5 min., and after dilution with water the mixture is extracted with Hecht's (A., 1936, 1552) mixed solvent [amyl alcohol and thiophen-free benzene (1 : 4)]. The atebrin is recovered from this solvent by three extractions with 0·1N-HCl, liberated by a few drops of 10N-NaOH, and taken up in amyl alcohol. Standard aq. solutions of atebrin are treated similarly, and the final solutions are compared colorimetrically. 2·5 μg. of atebrin or about 0·1 mg. per l. of blood can be determined. The error is 10—15%. J. N. A.

Distribution of quinacrin between blood corpuscles and plasma. C. LATASTE, M. E. FARINAUD, and N. VAN LIEN (J. Pharm. Chim., 1939, [viii], **30**, 5—13).—The transitory retention of quinacrin by the blood occurs predominantly in the red cells and is proportional to the quantity of protein present. H. G. R.

Curative action of nitrogenous compounds containing the sulphone group in mice infected with *Streptococcus*, Friedländer's bacillus, *Gonococcus*, and *Pneumococcus*. C. LEVADITI, A. GIRARD, and A. VAISMAN (Compt. rend., 1939, **208**, 1609—1611; cf. A., 1938, III, 224).—4-Nitro-4′-aminodiphenyl sulphoxide with the appropriate naphtholsulphonic acids gives Na_2 4-nitro-4′-diphenyl sulphoxide derivatives of azo-β-naphthol-, azo-α-naphthol-7-acetamido-, and azo-α-naphthol-8-acetamido-disulphonate (substances 94, 95, and 190,

respectively). 94, 95, or 190 in three doses by mouth of 20, 10, and 10 mg. protects mice against hæmolytic streptococci; 20 mg. and 10 mg. of 94 or 95 on successive days give 40% and 60% protection against gonococci. 20 mg. of 94 or 95 on 4 successive days gives 82% and 74% protection, respectively, against Friedländer's bacillus and 94% protection against type 2 pneumococci, but are less effective against types 1 and 3. J. L. D.

Anti-endotoxic chemotherapy. C. LEVADITI and A. VAISMAN (Compt. rend. Soc. Biol., 1939, **131**, 33—35).—Sulphamide, sulphone, and sulphoxide derivatives exhibit anti-endotoxic action against the endotoxins of the gonococcus and Flexner's bacillus in mice, the activity of the latter two groups being most pronounced. H. G. R.

Effects of quinine and plasmoquin administration on parasite reproduction and destruction in avian malaria. G. H. BOYD and M. DUNN (Amer. J. Hyg., 1939, **30**, c, 1—17).—Administration of quinine hydrochloride in doses of 0·5 mg. retarded, and in some cases prohibited, the reproduction of *Plasmodium cathemerium* in experimentally infected canaries. In doses of 0·25 to 0·5 mg. reproduction was not inhibited but the no. of merozoites formed by each schizont was reduced. Plasmoquin in daily doses of 0·02 mg. reduced the no. of merozoites produced by a single schizont; the period of reproduction was delayed and prolonged. Neither quinine nor plasmoquin when used in small doses increased the daily destruction of the parasites. B. C. H.

Test for permanent cure of *Bilharziasis hæmatobia* by Bayer 205. H. KUNERT (Zentr. Bakt. Par., I., 1939, **143**, 161—164).—Injection of Bayer 205 provokes excretion of dead and living eggs in the urine. Its use is therefore recommended as a test for latent infection and cure. G. W.

Antiseptic action of phenols, phenolcarboxylic acids, and of the lichens containing them and of their esters. II. Antiseptic action of orsellinic esters on shoyu. F. FUZIKAWA (J. Pharm. Soc. Japan, 1939, **59**, 93—94).—Ethyl, *n*-propyl, and *n*-butyl orsellinate have a more marked antiseptic action than the corresponding *p*-hydroxybenzoates towards shoyu. The esters are non-toxic. H. W.

Pharmacological action of acridine derivatives. EARL OF SUFFOLK AND BERKSHIRE (Quart. J. Exp. Physiol., 1939, **29**, 1—11).—Acriflavine in bacteriostatic concns. prolonged the survival period of the isolated frog's heart, with absence of toxic effects. Of 17 acridine derivatives tested, one only, 2-chloro-5-aminoacridine acetate, was toxic. The isolated auricle perfused with the fluorescent members of the series was unaffected by ultra-violet light. Some compounds (*e.g.*, acriflavine and atebrin) antagonised the action of acetylcholine on frog's auricle, rat's duodenum, rectum, and uterus, and dog's retractor penis, whilst others acted on the frog's tissue only. T. S. G. J.

Oxidation of adrenaline by succinic acid. Inhibition by cocaine and sparteine.—See A., 1939, II, 420.

Changes in spleen size, blood pressure, and erythrocyte count after administration of benzedrine sulphate in dogs. J. L. PINKSTON and J. O. PINKSTON (J. Lab. clin. Med., 1939, **24**, 1038—1045).—In anæsthetised dogs, intravenous injection of 1 mg. per kg. of benzedrine sulphate caused prolonged contraction of the exteriorised spleen, a transitory rise in blood pressure, and a rapidly occurring erythrocytosis. In dogs with adrenals removed the responses were similar, but if the spleen was removed the erythrocytosis did not occur. C. J. C. B.

Action of benzedrine. L. DAUTREBANDE, E. PHILIPPOT, and R. CHARLIER (Arch. int. Pharmacodyn., 1939, **62**, 179—201).—Benzedrine in doses of 5—20 mg. per kg. causes prolonged peripheral vasoconstriction and raises arterial pressure. Bradycardia is intense and due in the dog to reflex stimulation of the cardiac centre; it is also observed in the isolated frog heart. The output of urine is increased by renal vasodilatation. Respiration is stimulated through the carotid sinus. The autonomic nervous system is sensitised. On repetition large doses cause hypotension. D. T. B.

"Stimulating" action of quinine [on smooth muscle] due to lowered inhibition. E. STARKENSTEIN (Arch. int. Pharmacodyn., 1939, **62**, 146—167).—The excitatory action of quinine on the isolated gut is due to suppression of inhibition. Very low concns. only are effective and, through a small range, obey an "all or none" law. Large doses paralyse the gut muscle. Quinine sensitises the uterus in the same way; it potentiates the action of direct ecbolics. D. T. B.

Urea content of saliva and serum of horse after injection of arecoline. P. ROSSI and DAUBARD (Compt. rend. Soc. Biol., 1939, **130**, 1586—1587).—Injection of arecoline causes no increase in the urea content of the saliva or serum. H. G. R.

Differentiation between potassium and acetylcholine by sparteine. R. HAZARD (Compt. rend. Soc. Biol., 1939, **130**, 1105—1108).—Sparteine reverses the cardiac and vascular effects of acetylcholine and enhances those of $K^{\cdot}$. H. G. R.

Effect of yohimbine derivatives on arterial strips. H. F. CHASE, F. F. YONKMAN, and A. G. YOUNG (Proc. Soc. Exp. Biol. Med., 1939, **40**, 308—310).—Arterial muscle contracted by adrenaline is relaxed by yohimbine, but the effects of histamine, $NaNO_2$, or $BaCl_2$ are not modified. V. J. W.

Pharmacology of vasoconstrictor substances of serum. A. SIMON (Arch. exp. Path. Pharm., 1938, **190**, 273—279; cf. A., 1939, III, 458).—The rise of blood pressure caused by serum of cat, cow, pig, or sheep in the decapitated rat is potentiated by cocaine. The rise of blood pressure caused by serum of man, dog, and horse is unaltered. The blood-pressure effect of the sera of adrenalectomised cats is not less than that of normal animals. Intravenous injection of 0·5—1·0 c.c. of cat, dog, and human serum produces in the anæsthetised rat a pronounced fall of blood pressure which is not influenced by vagotomy or atropinisation. After administration

of several injections the depressor effect changes into a pressor one (ether narcosis). H. K.

Ascorbic acid investigations. M. Reiser (Arch. exp. Path. Pharm., 1938, **190**, 384—391).—Ascorbic acid in various amounts was given to rabbits and its excretion measured in urine. With 1·25 g. per kg. *per os* only 3·36% was recovered. 53% was excreted after continuous intravenous infusion, 75% after intravenous infusion into the ear-vein, and 67% after subcutaneous infusion. A continuous intravenous infusion of ascorbic acid (2·5 g. per kg.) in the cat produces only a slight rise of blood pressure. During the infusion the rise of blood pressure from an injection of adrenaline is potentiated. During a continuous adrenaline infusion the intravenous injection of ascorbic acid (250 mg. per kg.) produces a large increase of blood pressure. H. K.

Action of organic nitro-compounds. E. Keeser (Arch. exp. Path. Pharm., 1939, **192**, 618—624).—Ethyl nitrate has an inhibitor effect on the frog's heart, rabbit's gut, and leech muscle. Nitro-compounds inhibit the reduction of 2 : 4-dinitrophenol by muscle. They inhibit histaminase. The effect of ethylene glycol dinitrate on the dog can be antagonised by ascorbic acid. H. Bl.

Effect of corynantheine hydrochloride on vascular effects of adrenaline and carotid sinus occlusion. Raymond-Hamet (Compt. rend. Soc. Biol., 1939, **130**, 733—738).—In the chloralosed dog with vagi cut the intravenous injection of 242 mg. of the sympathicolytic substance corynantheine hydrochloride reversed the pressor and vasoconstrictor effects of adrenaline injection but had no effect on the less pronounced pressor and vasoconstrictor effects of carotid sinus occlusion. P. C. W.

Pharmacology of α-amino-β-phenyl-α-3 : 4-dihydroxyphenylethane. A. Lespagnol, G. Bizard, and J. Turlur (Compt. rend. Soc. Biol., 1939, **131**, 346—349).—This compound has a vasoconstrictor action and inhibits the tone and spontaneous movements of the intestine. It is an imperfect sympathomimetic drug. P. C. W.

Effect of ergotamine on hyperthermic action of dinitrophenol. E. Czarnecki and M. Rubinstein (Compt. rend. Soc. Biol., 1939, **131**, 362—365).—Hyperthermic action of dinitrophenol in the dog is unaffected by the previous injection of ergotamine. P. C. W.

Action of alkaloids from solanaceous plants and of their derivatives. A. W. Forst and Z. Kanda (Arch. exp. Path. Pharm., 1939, **192**, 405—413).—*l*-Hyoscyamine, injected subcutaneously, is 40 times as active on the pupil of mice as *d*-hyoscyamine; *l*-scopolamine is 10 times as active as *d*-scopolamine. In their effects on general motility the isomerides show no significant difference. H. Bl.

Action of β-hydroxyphenyl*iso*propylamines. B. von Issekutz, jun. (Arch. exp. Path. Pharm., 1939, **192**, 414—424).—The *meta*- and *para*-compounds have a pressor effect of a type similar to that of the corresponding methylamino-derivative veritol. They also cause a long-lasting contraction of the spleen. The pressor action of adrenaline is increased after the injection of these substances. H. Bl.

After-effects of acetylcholine injections. W. Riechert and W. Musehold (Arch. exp. Path. Pharm., 1939, **192**, 524—529).—After infusion of acetylcholine the time taken until the blood pressure returns to normal is independent of the duration of the infusion and of concn. The time is prolonged after eserine. H. Bl.

Carotid sinus reflex during carbon monoxide poisoning. H. W. Kayser (Arch. exp. Path. Pharm., 1938, **190**, 248—255).—After artificial respiration with a CO (0·01—2·0%)-air mixture the carotid sinus vascular reflex in urethane-anæsthetised cats is reversed (fall of blood pressure and pulse rate instead of rise); with 0·7% CO the reversal sets in after 7—35 min. when half of the hæmoglobin is saturated with CO. The same effect occurs after increase of brain pressure and artificial anæmia. Atropine, vagotomy, coramine, or cardiazol restores the reflex to normal. H. K.

Relation of cocaine and of procaine to the sympathetic system. D. F. MacGregor (J. Pharm. Exp. Ther., 1939, **66**, 393—409).—Intravenous injection of cocaine or of procaine caused dilatation of the normal and the denervated pupil, in cats. Procaine amplified the contractions of the isolated auricles, but the action of cocaine was toxic only. Both drugs inhibited the isolated intestine and, in large doses, the uterus. Lower concns. increased uterine tone. Both augmented the action of adrenaline *in vivo* and abolished its action on isolated tissues. Cocaine and procaine have a sympathomimetic action, complicated by a stimulant action on involuntary muscle and a toxic action on the heart. E. M. S.

Comparison of the actions of prostigmin and of guanidine on the activity of choline-esterase in blood serum. A. S. Minot (J. Pharm. Exp. Ther., 1939, **66**, 453—458).—Unlike prostigmin, guanidine has no inhibitory effect, *in vitro* or *in vivo*, on the activity of choline-esterase in blood serum of dogs. E. M. S.

Action of "syntropan" on the gastrointestinal tract. B. B. Clark, E. B. S. Shires, jun., E. H. Campbell, and C. S. Welch (J. Pharm. Exp. Ther., 1939, **66**, 464—478).—Syntropan inhibits small intestine, isolated or *in situ*. The effective dose, 100 times that of atropine, has less side action than atropine on the heart and pupil of the unanæsthetised dog. Small doses of syntropan antagonise parasympathomimetic drugs. Larger doses, unlike atropine, also antagonise drugs with a direct stimulant action on smooth muscle. Gastric motility is depressed by syntropan, but the effect on gastric secretion is weak. E. M. S.

Action of 2-diethylaminoethoxydiphenyl (1262 F.) on fibrillation. D. Bovet, E. Fourneau, J. Tréfouël, and H. Strickler (Arch. int. Pharmacodyn., 1939, **62**, 234—260).—A detailed account of work already noted (A., 1939, III, 454). D. T. B.

Detoxication of quinidine by sympathol. L. L. Kirchmann (Arch. exp. Path. Pharm., 1939, **192**,

639—644).—Sympathol raises the min. lethal dose of quinidine in cats. H. Bl.

Action of (para)sympathol on fibrillation of the heart. K. Van Dongen (Arch. int. Pharmacodyn., 1939, **62**, 261—263).—Sympathol raises resistance to causation of extrasystoles and fibrillation by electrical excitation. Fibrillation produced by the strongest stimulation always disappears. The refractory period and conduction time are shortened. Heterotropic rhythms due to adrenaline and $BaCl_2$ are prevented. D. T. B.

Relation of sugar component of *k*-strophanthin to pharmacological action. L. Lendle and H. Puhlmann (Arch. exp. Path. Pharm., 1938, **190**, 296—308).—Cymarin (strophanthidin + cymarose) and strophanthoside Stoll (cymarin + 2 glucose) show no loss of activity if kept for 3 days in aq. solution, at 37° and p_H 6. The activity of cryst. *k*-strophanthin (Merck) was diminished to $\frac{1}{4}$ under the same conditions; amorphous *k*-strophanthin (Boehringer) showed no loss. Frogs died in cumulative experiments if cymarin was given in 50% and strophanthin in 20% of the daily single lethal dose. No difference of activity was observed with cymarin and strophanthoside on the isolated frog's heart. The action on the frog's heart was not annulled by serum-albumin. H. K.

Effects of strophanthin and acetylcholine on the electrocardiogram. N. A. Nielsen and M. Trier (Amer. Heart J., 1939, **17**, 515).—In normal adults intravenous injection of acetylcholine or strophanthin has the same effect on the e.c.g. as vagal stimulation (carotid sinus pressure), viz., bradycardia, shortening of electrical systole, and flat *P* waves. This is compatible with the view that strophanthin sensitises the heart muscle to acetylcholine. C. A. K.

Effect of acetylcholine, choline, and potassium chloride on excitability of frog's ventricle. Z. Kanda (Arch. exp. Path. Pharm., 1938, **190**, 417—420).—The effect of acetylcholine on the refractory period of the frog's ventricle was investigated. The phase is shortened and the heart muscle becomes tetanisable as with muscarine. The same effect occurs with choline but is 1000 times weaker. KCl has no effect on the refractory period. H. K.

Cumulation of digitalis and performance of heart after treatment with small doses of digitoxin. F. Hahn (Arch. exp. Path. Pharm., 1939, **192**, 499—523).—In cats repeated injections of small amounts of digitoxin (5% of subcutaneous lethal dose) have a marked cumulative effect. Similar treatment has no marked influence on the performance of these hearts, as measured by the max. arterial pressure attained in the heart–lung prep. With high arterial pressures there is a tendency to extrasystoles. In dogs repeated injections of digitoxin (10% of intravenous lethal dose) lead to little or no increase of the animals' sensitivity to strophanthin in the "cumulation" experiment. In the heart–lung prep. these hearts show an improved max. arterial pressure on the day after the last injection of digitoxin. H. Bl.

Caffeine, theobromine, and theophylline as cardiac tonics. R. Charlier (Arch. int. Pharmacodyn., 1939, **62**, 370—376).—Caffeine, theobromine, and theophylline cause a well-marked increase of output from the heart. The muscle is stimulated and peripheral vasodilatation occurs. The cardiac effect is that of increased strength of systole. No difference between the three drugs was observed. D. T. B.

Method for examining action of digitalis and digitaloids on contractility of heart muscle. L. M. van den Berg and S. de Boer (Z. ges. exp. Med., 1939, **105**, 100—105).—An artificial rhythm was maintained by electrical stimulation of the sinus region of an isolated and perfused frog's heart. The action of digitalis and of erythrophloein on ventricular contractility was studied at const. rates of stimulation. A. S.

Pharmacology of Cheyne–Stokes respiration. M. H. Nathanson and J. P. Fitzgibbon (Amer. Heart J., 1939, **17**, 691—700).—Aminophyllin (theophylline + ethylenediamine) given intravenously in doses of 0·48 g. restored normal breathing in 16 out of 18 cases of Cheyne–Stokes respiration due mainly to heart failure. The effect usually lasted about 6—8 hr. Ethylenediamine alone is ineffective, but theophylline in other combinations was fully active. C. A. K.

Action of aminopyrine and antipyrine on oxidation of phospholipin by various tissues. F. Bernheim (J. Pharm. Exp. Ther., 1939, **66**, 459—463).—The rate of oxidation of rat liver phospholipin by rat liver protein or by rabbit bone marrow is slow, but is accelerated by vanadium. Oxidation, with or without V, is inhibited by aminopyrine but not by antipyrine. E. M. S.

Spasmolytic action of residue alkaloids of *Lobelia inflata*. R. Richter (Arch. exp. Path. Pharm., 1938, **190**, 280—295).—10 alkaloids and 2 alkaloid-free fractions of tinctures of lobelia were examined. No broncho-dilator substances were found. The emetic and expectorant properties of the tincture may account for its anti-asthmatic action. The action of the tincture on blood pressure and bronchi after intravenous administration and the effect on the isolated gut are due mainly to the presence of alkaloid B_1 (not yet chemically identified), which has a pronounced nicotine-like action. H. K.

Hepatopathy and osteitis deformans in an alcohol addict. E. Lyon (Gastroenterologia, 1939, **64**, 84—91).—Paget's disease of bone, vitamin-*A* deficiency, hepatopathy, and peripheral neuritis were found in an alcohol addict, aged 62 years. E. M. J.

Yatren in treatment of intestinal diseases. Silva-Mello (Gastroenterologia, 1939, **64**, 93—144). E. M. J.

Gastric antacids. W. L. Adams (Arch. intern. Med., 1939, **63**, 1030—1047).—A review. C. A. K.

Pectin–agar diets in treatment of bacillary dysentery of infants and children. M. Winters, C. A. Tompkins, and G. W. Crook (J. Pediat., 1939, **14**, 788—797).—52 cases of bacillary dysentery and 27 cases of infectious gastro-enteritis in infants and children treated with a pectin–agar–dextrimaltose

combination showed definite response in 34 hr. and a steady improvement in 73%. C. J. C. B.

Cholagogue action of derivatives of *p*-tolylmethylcarbinol and ferulic acid. H. SCHOENE (Arch. exp. Path. Pharm., 1938, **190**, 372—375).—*p*-Tolylmethylcarbinol is water-insol. Intravenous injection of water-sol. derivatives of the carbinol (camphoric and *o*-phthalic esters) increases bile secretion in guinea-pigs, rats, and dogs, for ½—2 hr. Na ferulate acts by causing contraction of the gall bladder. H. K.

Anthelminthics containing areca nut. H. SCHLEGEL (Arch. exp. Path. Pharm., 1939, **192**, 389—404).—In semen arecæ, D.A.B. VI, and other anthelminthics containing arecoline the assay on the isolated guinea-pig's intestine gives consistently smaller vals. for total alkaloid content than assay on the dog with duodenal fistula. This discrepancy is probably due to the destruction of a second active alkaloid, guvacoline, in the extracts used for the assay on the guinea-pig's gut. H. BL.

Synthetic substances with saponin-like action. R. FISCHER and D. TOTH (Arch. exp. Path. Pharm., 1939, **192**, 472—485).—"Zephirol" and "sapamines" are substances with high hæmolytic activities; the hæmolytic action of these substances is inhibited by cholesterol. Small doses (about 3 μg. per g.) bring about absorption of curare from the frog's intestine. Among a no. of other substances examined absorption from the intestine is facilitated only by those substances of which the hæmolytic actions are inhibited by cholesterol. H. BL.

Homœopathic drugs. III. Sulphur. P. MARTINI, L. BRÜCKMER, K. DOMINICUS, A. SCHULTE, and A. STEGEMANN (Arch. exp. Path. Pharm., 1939, **192**, 425—446).—Small doses of S have no effects on man. H. BL.

Rôle of liver in plasma loss in histamine and peptone shock. E. LERCHE and A. WEISS (Arch. exp. Path. Pharm., 1939, **192**, 676—682).—In dogs with Eck's fistula histamine and peptone shock cause the same plasma loss as in normal controls. Œdema of the liver can therefore not be the main cause of the phenomenon. H. BL.

Liberation of histamine by tissue damage. H. BACHMANN (Arch. exp. Path. Pharm., 1938, **190**, 345—355).—Cat's intestine was perfused with Tyrode's solution. Addition of $HgCl_2$ or $HgO,3Hg(CN)_2$ liberates a substance which acts like histamine on the guinea-pig's ileum. The histamine-like action of the perfusion fluid disappears after treatment with torantil or CO_2. Liberation of histamine was also observed during perfusion with emetine and As_2O_3 or treatment of the serosa with heat and phenol. H. K.

Association of hypnotic drugs. (A) Drugs of barbituric series. (B) Increase in anæsthetic action. L. OLSZYCKA (Compt. rend. Soc. Biol., 1939, **130**, 1242—1244, 1244—1246).—(A) The effect of the simultaneous administration of two barbiturate drugs to rats is additive.

(B) The association of alcohol with drugs such as ethyl*iso*amylmalonylurea produces a prolongation of the hypnotic action and profound anæsthesia in rats. H. G. R.

Estimation of analgesic actions [of morphine derivatives]. W. KOLL and H. REFFERT (Arch. exp. Path. Pharm., 1938, **190**, 687—711).—Two electrodes were permanently fixed into the dentine of the canines of the dog. The pulp was stimulated with rhythmical condensor discharges at 15 per sec., 1 sec. duration, and known voltage. Dogs show a pain reaction which is const. with the same stimulus. After subcutaneous injection of sedatives the threshold for the pain reaction is higher. The sedative effect of morphine, dilaudide, eucodal, acedicone, and dicodide on dogs was thus measured and was in accordance with the known results in man. H. K.

Effect of morphine and dihydrodeoxymorphine on motility. A. W. FORST (Arch. exp. Path. Pharm., 1939, **192**, 257—270).—Morphine has a stimulating effect on the motility of mice in very small doses; larger doses depress motility. Dihydrodeoxymorphine is ten times as active as morphine; in all doses the depressing effect of the latter is preceded by excitation. H. BL.

Effects of thiobarbiturates on splenic and renal volumes. V. G. HAURY, C. M. GRUBER, jun., and C. M. GRUBER (Arch. int. Pharmacodyn., 1939, **62**, 342—346).—Na thiopentobarbital, pentothal Na, and Na thioethamyl when injected intravenously into intact and spinal dogs may produce rise of blood pressure and decrease of splenic and renal vols. Evipan causes fall of blood pressure and dilatation of the viscera. The action on the vascular system is partly peripheral. D. T. B.

Action of barbiturates on rabbit's uterus. C. M. GRUBER and C. M. GRUBER, jun. (Arch. int. Pharmacodyn., 1939, **62**, 378—379).—Short-acting barbiturates (evipan and pentobarbital) and thiobarbiturates (thiopentobarbital, pentothal, and thioethamyl) have the same actions on excised uterine segments as the longer-acting barbiturates. Dilutions of 1 in 5000 to 1 in 50,000 cause rapid loss of tone. D. T. B.

Effect of individual variation on quantitative pharmacology. A. J. CLARK (Angew. Chem., 1939, **52**, 446—448).—A lecture on statistical aspects of the response of mice to evipan and of *Aphis rumicis* to nicotine. F. O. H.

Buccal oxygen-ether catheter. R. COHEN (J. Pediat., 1939, **14**, 807—809). C. J. C. B.

Pharmacologic study of trichloroethanol. G. LEHMANN and P. K. KNOEFEL (Amer. J. med. Sci., 1939, **197**, 639—646).—Trichloroethanol had an anæsthetic action resembling that of tribromoethanol, but was less depressant to respiration and had a wider margin of safety. The excretion and toxicity are discussed in relation to possible clinical use. R. L. N.

Effect of chloroform, evipan, and veronal on the activity of the motor cortex. V. RASCANU, M. KAPRI, and G. POPOVICI (Compt. rend. Soc. Biol.,

1939, **130**, 1602—1605).—These anæsthetics depress the excitability and action currents of the motor cortex in the dog. The effects of veronal are more pronounced and longer-lasting than those of evipan and those of evipan than those of $CHCl_3$. P. C. W.

Morphine and chloroform in liver atrophy. W. M. Millar and J. Park (Brit. Med. J., 1939, I, 1284—1285).—Signs of liver damage occurred in a morphine addict after $CHCl_3$ induction of anæsthesia for partial gastrectomy. C. A. K.

Anæsthetic properties of allene (propadiene). J. K. W. Ferguson (J. Pharm. Exp. Ther., 1939, **66**, 449—452).—Allene, administered in anæsthetic concns. to cats and rats, produced pulmonary œdema. E. M. S.

Metycaine in oil [for prolonged anæsthesia]. J. S. Lundy, A. E. Osterberg, and H. E. Essex (Proc. Staff Mayo Clin., 1939, **14**, 360).—A favourable preliminary report on the use of peanut oil as a vehicle for metycaine in the production of prolonged local anæsthesia. A. M. G.

Action of novocaine and urea on frog's motor nerve. A. Guntermann (Arch. exp. Path. Pharm., 1939, **192**, 714—722).—Addition of urea (0·1—2·5%) lowers the min. effective anæsthetic concn. of novocaine to about $\frac{1}{10}$. H. Bl.

Untoward effects during surface pantocain anæsthesia [of respiratory tract]. H. Fasselt (Arch. Ohr.-, Nas.-, u. Kehlkheilk., 1939, **146**, 216—219).—2 patients had epileptiform attacks after surface anæsthesia of larynx and trachea with a 2% pantocain solution containing 3 drops of corbasil in 10 c.c. (total amount of anæsthetic given 6 c.c.). C. E.

Absorption, distribution, and elimination of alcohol. IV. Elimination of methyl alcohol. H. W. Haggard and L. A. Greenberg (J. Pharm. Exp. Ther., 1939, **66**, 479—496; cf. A., 1935, 116). —More than 70% of methyl alcohol is eliminated in the expired air. Elimination follows the principle defined (cf. A., 1923, ii, 343) for volatile substances which are largely non-reactive. The amount eliminated in unit time is determined by the concn. of alcohol in the blood and the vol. of pulmonary ventilation. E. M. S.

Potentiation of procaine spinal anæsthesia in rabbit. R. W. Cunningham and R. N. Bieter (J. Pharm. Exp. Ther., 1939, **66**, 410—422).—All equimol. mixtures of 0·12M-$MgCl_2$ and -$CaCl_2$ in NaCl solutions potentiated the spinal anæsthetic action of procaine in rabbits. The optimum mixture, $15MgCl_2$, $15CaCl_2$, 70NaCl, increased sensory anæsthesia 8-fold and motor paralysis 2-fold, without causing irritation. Solutions containing more Mg than Ca, or Mg without Ca, produced symptoms of irritation. Solutions containing more Ca than Mg, or Ca without Mg, caused lasting motor paralysis. E. M. S.

Concentration of procaine in cerebrospinal fluid of the human being after subarachnoid injection. H. Koster, A. Shapiro, and R. Warshaw (Arch. Surg., 1939, **39**, 97—103). W. d'A. M.

Influence of vasoactive substances on injection anaesthesia. E. Werle and T. Lentzen (Arch. exp. Path. Pharm., 1938, **190**, 328—340).—Kallikrein and histamine increase and prolong narcosis with eunarcon, evipan, and urethane. Acetylcholine and adenylic acid have no influence. Vasopressin, adrenaline, and sympathol have a potentiating action. The combination of vasoactive substances with these narcotics is regarded as dangerous. H. K.

Local anæsthetics from β-2-piperidylethyl alcohol.—See A., 1939, II, 445.

Effect of vagotonin on respiratory effects of caffeine and lobeline. R. Grandpierre and C. Franck (Compt. rend. Soc. Biol., 1939, **130**, 718—720).—The respiratory stimulation produced in the chloralosed dog by administration of caffeine or lobeline is increased following injection of vagotonin. The augmentation of the effects of lobeline still obtains after denervation of the carotid sinus. P. C. W.

Clinical experiences with veritol. A. Ott (Klin. Woch., 1939, **18**, 993—995).—Injection of 0·02 g. or oral administration of 0·03 g. of veritol increased the blood pressure in some cases of peripheral circulatory failure; the effect on the blood vol. was variable. E. M. J.

Step-photometric carbon monoxide-hæmoglobin determination. H. Oettel (Arch. exp. Path. Pharm., 1938, **190**, 233—247).—20 or 25 cu. mm. of blood are diluted with 0·1% NH_4Cl solution to 2 or 2·5 c.c. and reduced with $Na_2S_2O_4$. The presence of CO-hæmoglobin in blood is controlled by means of a hand spectroscope. The extinction of the reduced blood solution is measured in a step-photometer with filters S57 and S53 (20 readings). From the extinction vals. the quotient $Q = E_{s53}/E_{s57}$ is determined. The amount of CO-hæmoglobin $= (100Q - 93)/0·4$. The measurement takes 5—10 min. The accuracy of this method is claimed to be sufficient for forensic and clinical needs. H. K.

Response of capon's comb to androsterone. D. R. McCullagh and W. K. Cuyler (J. Pharm. Exp. Ther., 1939, **66**, 379—388).—Quant. study of the response of the capon's comb showed that the inunction method for the assay of androsterone was 30 times as sensitive as the intramuscular injection method. E. M. S.

Effects of various agents on metabolic rate in experimental hyperthyroidism. W. C. Cutting and G. B. Robson (J. Pharm. Exp. Ther., 1939, **66**, 389—392).—NaI diminished the increase in metabolic rate produced in guinea-pigs by administration of pituitary thyrotropic hormone. Other agents, including various vitamins and œstrogenic hormone, were ineffective. E. M. S.

Rôle of molecular oxygen in antispirochætal activity of arsenic and bismuth compounds *in vitro*. H. Eagle (J. Pharm. Exp. Ther., 1939, **66**, 423—435).—The antispirochætal action *in vitro* of arsenoxide (*m*-amino-*p*-hydroxyphenylarsenoxide) and Bi compounds is the same whether tested aërobically or under N_2, and is due to these compounds as such. The activity of neoarsphenamine is almost

abolished in absence of mol. O_2, and is due to the formation of oxidation products. Oxidation proceeds rapidly and in absence of tissue extractives. The activity of arsphenamine and Ag arsphenamine is markedly reduced, but there is a small residual activity in the absence of O_2. E. M. S.

Effect of sulphydryl compounds on the antispirochætal action of arsenic, bismuth, and mercury compounds *in vitro*. H. EAGLE (J. Pharm. Exp. Ther., 1939, **66**, 436—448).—Cysteine, glutathione, and thioglycollic acid added in sufficient excess to arsphenamine, neoarsphenamine, Ag arsphenamine, arsenoxide, $HgCl_2$, and Bi compounds almost abolish their antispirochætal action on *T. pallidum*, *in vitro*, due to formation of relatively inactive additive compounds. Therapeutic activity of As, Bi, and Hg may be due to similar combinations with SH groups in the spirochæte. Thiamine chloride and methionine, which contain ·S· rather than ·SH group, have no inhibitory effect. E. M. S.

Action of 4-dimethylaminoazobenzene-4′-arsinic acid. T. SASAKI and N. NAGAO (Proc. Imp. Acad. Tokyo, 1939, **15**, 156—164).—When a 0·09—0·009% solution of 4-dimethylaminoazobenzene-4′-arsinic acid (with or without 4-dimethylaminoazobenzene) in olive oil, absorbed on unpolished rice, is fed to rats, cancer is not produced, but the ductus choledochus becomes enlarged and sometimes contains stones. Intraperitoneal injection has the same effect. Dimethylaminoazobenzene alone or with atoxyl is innocuous. R. S. C.

Toxicity and elimination of chromium salts. F. CAVALLI and V. GESSAGA (Arch. int. Pharmacodyn., 1939, **62**, 330—341).—The toxicity of $Cr_2(SO_4)_3$ and $CrCl_3$ for rodents is less than that of dichromate. Cr acetate, which is rapidly eliminated in the urine, is 30 to 50 times less toxic than dichromate. The inorg. salts are eliminated slowly in urine and fæces. Reducing substances are not antidotes, as the resulting products possess considerable toxicity. D. T. B.

Pharmacology of strontium. IV. Emetic action. A. BORIANI and G. BORIANI (Arch. Farm. sperim., 1939, **68**, 14—33; cf. A., 1939, III, 715).—Intravenous injection of aq. $SrCl_2$, equiv. to more than 0·05 g. of Sr per kg., causes vomiting in dogs after approx. 5 min. The gastric movements (examined radiographically) during vomiting are described and the nervous mechanism involved is discussed. F. O. H.

Fate of cobalt after oral administration. M. SIMESEN (Arch. int. Pharmacodyn., 1939, **62**, 347—356).—Metallic Co after oral ingestion in rabbits is slowly absorbed and slowly excreted by the kidneys. After subcutaneous injection of carbonatotetrammine-cobalt chloride about 60% of the Co is excreted in 3 hr. and 70—80% in 24 hr. This salt is absorbed very slowly by the mouth. D. T. B.

Pharmacology of sodium gluconate. S. GAJATTO (Arch. Farm. sperim., 1939, **68**, 1—13).—Na gluconate (min. lethal, intravenous dose in rabbits 7·630 g. per kg.) has a depressive action on the central nervous system. The isolated toad's heart is slightly stimulated by moderate, and inhibited by high, concns. Large doses diminish respiration and blood pressure whilst moderate doses are vasodilatory. F. O. H.

Pharmacology of sodium lactate. S. GAJATTO (Arch. Farm. sperim., 1939, **68**, 34—52).—Intravenous injection of Na lactate into rabbits (min. lethal dose 5·0978 g. per kg.) causes somnolence and muscular paralysis. Small doses do not affect the isolated toad's heart and are vasodilatory, whilst large doses stop the heart and are vasoconstrictory. F. O. H.

Bone changes in chronic fluorine poisoning. F. J. LANG (Klin. Woch., 1939, **18**, 1035).—Prolonged administration of F_2 to growing dogs disturbed the calcification of the intercellular substance of bones, and produced periosteal outgrowths, and a microscopical picture resembling human rickets. E. M. J.

Toxic effects and excretion of gelsemine. A. RISI (Z. Biol., 1939, **99**, 446—456).—The lethal dose of gelsemine for rabbits is 0·51 mg. Histological changes were found mainly in kidneys and liver. The alkaloid is excreted by the kidneys. B. K.

3 : 5-Dinitrophenol. A. RISI (Z. Biol., 1939, **99**, 431—445).—The lethal dose of 3 : 5-dinitrophenol for guinea-pigs (subcutaneous) is 0·05 g. per kg. A characteristic symptom in contrast with other nitrophenols is paralysis of the hind limbs. Sublethal doses cause toxic symptoms lasting for 6—14 days. Histological changes are found especially in liver and kidneys. B. K.

Comparison of effects of pure and commercial benzene on vasomotor system. R. CHARLIER and P. ANGENOT (Compt. rend. Soc. Biol., 1939, **130**, 779—782).—Both pure and commercial benzene paralyse the peripheral vasomotor system in the anæsthetised dog by direct action on the smooth muscle of the vessel walls. The commercial grades are more toxic. The toxicity is not due to the thiophen content. P. C. W.

Fatal poisoning by "'meta fuel" tablets. D. R. LEWIS, G. A. MADEL, and J. DRURY (Brit. Med. J., 1939, I, 1283—1284).—Fatal poisoning from metaldehyde occurred in a boy aged 2½. Abdominal pain and convulsions were the chief symptoms and autopsy showed intense fatty degeneration of the liver. C. A. K.

Action of heavy water on growth of young animals. K. HANSEN and K. WUELFERT (Arch. exp. Path. Pharm., 1938, **190**, 671—680).—D_2O has a slight inhibiting action on the growth of young mice, but even 8% D_2O in the organism does not hinder conception, pregnancy, or delivery. H. K.

Comparison of narcotic action of deuteroethyl ether and ethyl ether. K. HANSEN and O. DYBING (Arch. exp. Path. Pharm., 1939, **192**, 600—602).—The narcotic effects of ethyl ether and decadeuteroethyl ether on *Daphnia magna* are the same. H. BL.

Mechanism of action of dichloroethyl sulphide (yperite) on living cells. A. KLING, P. DE FONBRUNE, and F. RAYNAL (Compt. rend., 1939, **208**, 1679—1681; cf. A., 1937, III, 134).—0·1N-HCl, 0·5N-thiodiglycol, and yperite have no action on *Amœba sphæronucleus* when injected into the living

cell. Immersion of the amœba in 0·01N-HCl kills it rapidly, but 0·5N-thiodiglycol has only a transient effect. Very dil. solutions of yperite cause cessation of cyclosis, coagulation of the nucleus, and swelling of the cell. These effects are irreversible. Yperite probably impairs the permeability of the cell wall, apart from the action of HCl liberated as a result of hydrolysis. J. L. D.

Action of toxic doses of atropine on central nervous system. T. Koppanyi (Proc. Soc. Exp. Biol. Med., 1939, **40**, 244—248).—Large doses of atropine are depressant to the frog but in the cat and dog cause preliminary depression followed by stimulation. Atropine potentiates the effects of nembutal and of strychnine. V. J. W.

Atropine intoxication. H. G. Morton (J. Pediat., 1939, **14**, 755—760).—The toxic symptoms were hot dry flushed skin, dilated pupils, nausea, diarrhœa, staggering gait, and coma. Fatalities have occurred in children from 0·4 mg. of the drug. Treatment consists of administration of parasympathetic drugs until the mouth is moist, copious lavage of the stomach, cerebral stimulants if coma is present, and catherisation of the bladder. C. J. C. B.

Toxicity of extracts of *Ascaris*. M. Machebœuf and R. Mandoul (Compt. rend. Soc. Biol., 1939, **130**, 1032—1034).—A non-dialysable substance producing lethal shock in guinea-pigs by intravenous injection can be extracted from *A. megalocephala* by trichloroacetic acid. H. G. R.

Comparative toxicity of extracts of *Ascaris* and *Tœnia*. R. Mandoul (Compt. rend. Soc. Biol., 1939, **130**, 1035—1036).—The toxic substance of *Ascaris* (cf. preceding abstract), occurring in both the peri-enteric fluid and the tissues, is not found in *Moniezia expansa*. H. G. R.

Toxicity of 3-indolylacetic acid and other organic acids with analogous action. A. Berthelot and J. Dieryck (Compt. rend. Soc. Biol., 1939, **130**, 1524—1526).—The vals. obtained for doses toxic to mice by intraperitoneal injection were 3-indolylacetic acid 0·187—0·2, 3-indolylpropionic acid 0·25—0·4, phenylacetic acid 0·1—0·15, α-naphthylacetic acid 0·1—0·2 g. per kg. The higher vals. obtained by Anderson *et al.* (A., 1936, 1553) were due to toxicity of the solvent (ethylene glycol). H. G. R.

Chazuta curare and allied plants. K. Folkers and K. Unna (Arch. int. Pharmacodyn., 1939, **61**, 370—379).—Compared with a standard Merck curare the extract of Peru chazuta curare is very toxic. It is derived from several plants, of which the most toxic is *Chondodendron tomentosum*, which may be the source of tubocurarine (King). *C. limacifolium* though rich in toxic alkaloids has no curare-like action, which *Elissarrhena grandifolia* has. D. T. B.

Effect of smoking on blood-sugar and peripheral temperature of convalescents. H. B. Cates and J. G. Giovanaszzi (J. Lab. clin. Med., 1939, **24**, 729—734).—Smoking does not elevate capillary blood-sugar levels. Patients with hypertension show no more vascular response to smoking than non-hypertensives. C. J. C. B.

Action of cholestenonesulphonic acid. A. Heinemann (Arch. exp. Path. Pharm., 1938, **190**, 316—327).—The strong hydrotropic action of the drug makes substances such as cholesterol, vitamin-*D*, or camphor water-sol. It diminishes the surface tension of water. Mice died with cramps after subcutaneous injection of 0·15 g. per kg. A fall of blood pressure occurred in rabbits after intravenous injection of 0·0116 g. of the Na salt. On isolated hypodynamic frogs' hearts a 0·003% solution increases, while 0·03% decreases, the rate. The Na salt is hæmolytic *in vitro*; this action is antagonised by cholesterol. It has a saponin-like action on the Laewen-Trendelenburg prep. H. K.

Analysis of sediment of pollen extract obtained by vacuum filtration; its questionable specific excitant activity. H. H. Gelfand, G. Flamm, and A. J. Heifitz (J. Lab. clin. Med., 1939, **24**, 1077—1080).—In the prep. of pollen extracts using buffered saline solution (coca extracting fluid) filtration causes a withdrawal of CO_2 with resultant pptn. of sediment. Pressure filtration by means of CO_2 or air (10—20 lb.) is recommended. The positive reaction obtained with small amounts of sediment in sensitive patients is due to the absorbed protein from the solution due to filtration. C. J. C. B.

Serum reactions. F. J. O'Meara (J. R.A.M.C., 1939, **72**, 187—190).—Various reactions after injection of 1—380 c.c. of serum are described. In 2 cases malaise, fever, enlargement of all lymph glands and of the spleen occurred after a week. Ca lactate did not act as a prophylactic. A. J. B.

Anaphylaxis in the pregnant rat. O. D. Ratnoff (Proc. Soc. Exp. Biol. Med., 1939, **40**, 248—251).—There was no difference between pregnant and non-pregnant rats in their anaphylactic response to horse serum. V. J. W.

Pulmonary anaphylaxis caused in rabbit by its own urine. R. Jahiel, M. Rosen, and R. Morel (Compt. rend. Soc. Biol., 1939, **130**, 1005—1008).—Injection of 0·5 c.c. of its own urine into the lung of a rabbit was followed 20—40 days later by intravenous injection of 1—2 c.c. of the urine. The urine was removed from the bladder by laparotomy under anæsthesia in both cases and the intravenous injection given whilst the animal was still anæsthetised. A typical anaphylactic reaction was found in the lung 5 min. after the intravenous injection. Neither of the injections alone produced this reaction. P. C. W.

Attenuation of anaphylactogenic properties of antitetanus serum by keten. H. Goldie and G. Sandor (Compt. rend. Soc. Biol., 1939, **130**, 1530—1532).—The anaphylactogenic power of the serum can be destroyed without affecting the antitoxic power by acetylation of 30—40% of the NH_2 groups with keten. H. G. R.

Inactivation of ragweed pollen extracts by adsorption and electric charge of resultant surface. H. A. Abramson, A. M. Sookne, and L. S. Moyer (J. Allergy, 1939, **10**, 317—326).—The electrical properties of quartz particles covered with material adsorbed from ragweed extracts are

those typical of ampholytes. The isoelectric point of these particles covered with a fresh extract was p_H 3·9. On keeping, this shifted to p_H 4·3, where it was stabilised for some time. Experiments with paraffin oil and collodion particles showed that these particles acquired similar amphoteric surface properties in ragweed extracts, corresponding with those found when the adsorbent was quartz. The titration curves of ragweed extracts were typical of solutions of proteins with a max. acid-binding capacity near p_H 2·6. The data obtained support the view that the skin reactive constituent in ragweed extracts is protein-like in nature. C. J. C. B.

Allergy to grain dusts and smuts. L. H. HARRIS (J. Allergy, 1939, **10**, 327—336).—The evidence indicating ætiological relationship of grain dusts and grain smuts to 13 cases included: (*a*) history of asthma or hay fever after exposure to grain dusts, especially to musty grain dust; (*b*) positive skin tests, both dermally and intradermally, to grain dusts and grain smuts; (*c*) presence of transferable reagins to grain dusts in every case and to one or more grain smuts in every case; (*d*) occasional constitutional reactions with use of grain dust extracts subcutaneously; (*e*) successful reproduction of symptoms by instillation of grain. C. J. C. B.

Comparative results of skin testing with cooked and uncooked foods. J. I. MALKIN and H. MARKOW (J. Allergy, 1939, **10**, 337—341).—Of 652 pairs of tests, it was shown that 91% were equal, that in only 3·9% the raw extract reacted positively against a negative cooked test, and that in 4·3%, the cooked extract reacted positively against a negative raw test. C. J. C. B.

Pine pollen allergy. A. H. ROWE (J. Allergy, 1939, **10**, 377—378).—Pine pollen allergy productive of bronchial asthma and nasal allergy and associated with large scratch skin reactions is recorded. C. J. C. B.

Use of whole bee extract in sensitisation to bees, wasps, and ants. H. E. PRINCE and P. G. SECREST, jun. (J. Allergy, 1939, **10**, 379—381).—3 cases are reported with hyposensitivity, induced by bee extract, to other insects. C. J. C. B.

New method of preserving pollen and dust extracts. M. B. COHEN (J. Allergy, 1939, **10**, 385).—The extracts are lyophilised and used as required. C. J. C. B.

Antiphlogistic action of purified azulene from *Matricaria chamomilla*, L. W. HEUBNER and W. ALBATH (Arch. exp. Path. Pharm., 1939, **192**, 383—388).—The volatile oil of the German camomile contains a deep blue fraction, b.p. 150—200°/11 mm., consisting of azulene, $C_{15}H_{18}$. This fraction is responsible for the antiphlogistic effects of camomile; it protects the rabbit's and cat's eye from mustard oil inflammation; it shortens the duration of the erythema due to irradiation of the rat's skin; it mitigates the irradiation erythema on the human skin. The remaining fraction of the oil had no effect. H. BL.

Influence of ethyl alcohol, glucose, and sucrose on the stability of vitamin-*C*. W. KLODT and B. STIEB (Arch. exp. Path. Pharm., 1938, **190**, 652—657).—Ethyl alcohol slightly inhibits the oxidation of natural vitamin-*C* but has a greater action on synthetic ascorbic acid. Glucose (10%) has an inhibitory effect on synthetic ascorbic acid and also increases the inhibiting action of alcohol. 50% sucrose protects natural -*C* against oxidation. H. K.

Tuberculin skin-reaction and the intradermal histamine reaction in non-tuberculous man. J. BRAHIC and J. VEYRON (Compt. rend Soc. Biol., 1939, **131**, 390—392).—Results of the 2 tests in the non-tuberculous patient are approx. parallel. P. C. W.

Tuberculin skin-reaction after histamine. J. OLMER, G. BAUDELET, and AGEZE (Compt. rend. Soc. Biol., 1939, **131**, 395—396).—44 women giving negative skin-tests with tuberculin were tested after an intradermal injection of histamine. In 13 cases the test became positive. P. C. W.

Optical inversion of the benzyl derivatives of *d*-cysteine and *d*-homocysteine *in vivo*. V. DU VIGNEAUD, J. L. WOOD, and O. J. IRISH (J. Biol. Chem., 1939, **129**, 171—177).—When fed to rats, *d*(—)- or *l*(+)-α-amino-γ-phenylbutyric acid is recovered from the urine as the *N*-acetyl derivative of the *l*(+)-acid (cf. A., 1938, II, 98). *S*-Benzyl-*d*-cysteine or -*d*-homocysteine is similarly recovered as *N*-acetyl derivative of the corresponding *l*-compound. R. S. C.

Non-specific therapy. W. WEICHARDT (Klin. Woch., 1939, **18**, 920—922).—A review. E. M. J.

(xxi) PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

Report on medical progress. Industrial medicine. W. I. CLARK (New England J. Med., 1939, **221**, 269—273). A. M. G.

Dust in industrial work. D. HARRINGTON (U.S. Bur. Mines, 1939, Inf. Circ. 7072, 12 pp.).—A review of the harmful effects of dust on health, safety, and efficiency, with a discussion of the most practical methods of prevention and control. E. M. K.

Composition of stone and of inhaled dust in relation to silicosis. I, II. A. SHAW (Proc. S. Wales Inst. Eng., 1939, **15**, 96—111, 112—142).—I. The free SiO_2 content of rocks in different British coalfields is correlated with the certified cases of silicosis (1931—1938) in the different areas. In England and Scotland the incidence of silicosis is low, and cases are usually associated with hard heading work in rock containing 34—80% of free SiO_2. In S. Wales the recorded incidence is high, but cases occur mainly amongst colliers at the coal face in the anthracite area, where there is no exposure to dust with a high free SiO_2 content. Cases where soft sandstones and shales with a free SiO_2 content of 50—80% are worked with no apparent harm are thought to be due to low dust concns.

II. Dust of max. particle size 5—6 μ. was obtained by air elutriation of samples of dust deposited in the working place or of samples collected by drilling rock in the laboratory. The free SiO_2 content of these dusts was usually less than that of the rock from which

they were formed. The dusts are classified according to the recorded incidence of silicosis amongst the men exposed to them; on this basis the "harmful" dusts contained 45—94% of free SiO_2, the "harmless" dusts contained less than 35% (if dusts produced in open quarries are excluded), and the "possibly harmful" dusts were intermediate. In the anthracite pits the main incidence of silicosis is amongst colliers at the coal face; this incidence cannot be related to working highly siliceous rock; hence the disease may not be true silicosis. E. M. K.

Heat stroke and allied conditions. T. B. NICHOLLS (J. R.A.M.C., 1939, **72**, 73—84).—Saline, $NaHCO_3$, Na citrate, or cream of tartar reduced the incidence of heat stroke. Constipation and excessive purging with salts conduces to salt depletion and heat stroke, as does over-exercise or insufficient sleep. A. J. B.

(xxii) RADIATIONS.

Radiation therapy in treatment of inflammatory lesions. F. O. COE (New England J. Med., 1939, **220**, 471—474).—*X*-Ray therapy is a safe and valuable agent in the treatment of cervical adenitis, cellulitis, furunculosis, mastitis, sinusitis, bronchitis, carbuncle, pneumonia, breast abscess, and erysipelas. A. M. G.

Diagnostic roentgenology. R. SCHATZKI (New England J. Med., 1939, **220**, 747—752).—A review of progress. A. M. G.

Physico-chemical basis of short-wave therapy. L. CAVALLARO (Strahlenther., 1939, **65**, 237—246).—A review. E. M. J.

Protection against ultra-violet light erythema. J. KIMMIG and R. DÜKER (Strahlenther., 1939, **65**, 315—329).—5—10% of coumarin, *iso*safrole, stilbene, benzylideneacetophenone, or dibenzylideneacetone in various solvents, mainly spirit, or in petroleum jelly protected the skin against erythema production by ultra-violet light (290—320 mμ.) E. M. J.

Reaction of small skin fields in Chaoul technique. A. KAUTZKY (Strahlenther., 1939, **65**, 344—352).—The diminished reaction of very small skin fields with this method of irradiation by *X*-rays is due partly to biological reasons and partly to the formation of a coat radiation around the main cone of rays, varying with the varying focus skin distance in relation to the size of the focus. E. M. J.

Influence of wave-length on irradiation of biological objects. M. LAPENNA (Strahlenther., 1939, **65**, 247—282).—Several organs of rats and mice as well as young *Vicia faba equina* were irradiated with 570 r. by hard (160 kv., λ 0·33 A.) and soft (110 kv., λ 0·18 A.) *X*-rays and 540 r. produced by 600 mg. of Ra. The effects on cholesterol content, water, Cl, and P metabolism of various organs, and on plant growth, were observed. Changes were greatest and most prolonged with harder rays, less marked and short-lived with softer rays and Ra. The theories on mode of action of irradiation of biological objects are reviewed. E. M. J.

Ray sensitisation by physical methods. A. VALLEBONA (Strahlenther., 1939, **65**, 361—368).—A review of the author's experimental work. E. M. J.

Electrolyte content of fresh water as protection against light. E. MERKER (Naturwiss., 1939, **27**, 470).—Tadpoles and other moist-skinned animals differ in their sensitivity towards light according to the water in which they are placed. The time taken to kill frog and toad tadpoles by irradiation with short-λ light increases with increasing $Ca^{\cdot\cdot}$ content of the water. If the animals are irradiated, the [Ca] and [Na] in the water increase, and after a time K appears. The protection afforded by these ions against light is apparently an absorption effect. A. J. M.

Anaërobic photochemical reduction of redox dyes by pyruvic acid, lactoflavin, and quinine.—See A., 1939, I, 530.

Mechanism of photochemical production of hydrogen peroxide.—See A., 1939, I, 530.

(xxiii) PHYSICAL AND COLLOIDAL CHEMISTRY.

Application of Poiseuille's law to suspensions of red corpuscles under different experimental conditions. G. ACHARD (Compt. rend. Soc. Biol., 1939, **131**, 542—544).—Under the conditions studied, suspensions of red cells behave as pure liquids. H. G. R.

Spectrophotometric studies. VI. Absorption spectra of non-hæmolysed erythrocytes and scattering of light by suspensions of particles. Spectrophotometric determination of the p_H within the erythrocyte. D. L. DRABKIN and R. B. SINGER (J. Biol. Chem., 1939, **129**, 739—757).—A spectrophotometric method has been used to study suspensions of fat with and without addition of oxyhæmoglobin, and suspensions of dog erythrocytes in saline, serum, etc. In the former, total extinction (ϵ_t) is due to scattering extinction (ϵ_s) + extinction due to pigment (ϵ_p), whilst in the latter it is best expressed by the equation $\epsilon_t = \epsilon_s + \epsilon_p.f_1(Nd)$, where d is the depth of the suspension and ϵ_s is also a function of Nd. ϵ_p can be derived from determination of ϵ_t and Nd. The p_H within the erythrocyte is determined by utilisation of the indicator property of methæmoglobin. P. G. M.

Solubility of the hæmerythrin of *Sipunculus* in presence of neutral salts. J. ROCHE and Y. DERRIEN (Compt. rend. Soc. Biol., 1939, **131**, 384—386).—The hæmerythrin (A., 1933, 409) is pptd. in 1·3—1·5M-$(NH_4)_2SO_4$ and 1·2—1·5M. solution of an equimol. mixture of KH_2PO_4 and K_2HPO_4. H. G. R.

Solubility, state of dispersion, and specificity of various hæmocyanins. J. ROCHE and Y. DERRIEN (Compt. rend. Soc. Biol., 1939, **131**, 386—390).—Pure hæmocyanins exhibit different solubility characteristics in aq. $(NH_4)_2SO_4$ and behave as heterogeneous substances. H. G. R.

Cell for measurement of the resistance of small quantities of biological liquids. Application to cerebrospinal fluid. M. VÉRAIN, P.

MICHON, R. ROUSSEAUX, and J. HARMAND (Compt. rend. Soc. Biol., 1939, **131**, 319—320).—The resistance of pathological c.s.f. varies inversely as the Cl′ content. H. G. R.

Distribution of fatty alcohols between external medium and tissue fluids of aquatic animals. Effect of salt concentration of external medium. R. JACQUOT and A. LINDENBERG (Compt. rend., 1939, **208**, 2106—2108).—In fresh water, the ratio of alcohol concn. in the tissue fluids of *Blennius pholis* or *Gasterosteus leiurus* to that in the aquarium is less than 1 (except for *iso*amyl alcohol) and depends on the mol. wt. of the alcohol and its effect on γ. In sea-water, the ratio for methyl, ethyl, and *iso*propyl alcohol is 1; for propyl, butyl, and amyl alcohol, it is above 1. In twice-conc. sea-water, the ratio is always above 1 and increases with increase in mol. wt. and effect on surface tension of the alcohol. In marine worms, in which the composition of the body fluids follows that of the aquarium water, the above ratio is 0·93—0·95 in fresh, sea-, or twice-conc. sea-water. J. L. D.

Apparent shape of protein molecules. H. NEURATH (J. Amer. Chem. Soc., 1939, **61**, 1841—1844).—Svedberg's dissymmetry consts. are calc. for 37 proteins and combined with Perrin's equation for the linear diffusion of ellipsoidal mols., on the assumption that protein mols. are prolate ellipsoids, to calculate the short (A) and long (B) diameters of the protein mol. The results are held to give relative but not abs. shapes. All the proteins, except erythrocruorin (*Arca*) and the Bence-Jones protein α, are strongly asymmetric. This applies also to globular proteins in accordance with other evidence. Similar calculations for the components of hæmoglobin, phycocyan, and hæmocyanin (*Helix pomatia* and *Busycon*) show that with one exception either A or B remains const., *i.e.*, that fission occurs only in directions parallel to the major or minor axis. R. S. C.

Calculation of shape of protein molecules.—See A., 1939, I, 455.

Structure of insulin.—See A., 1939, I, 459.

Changes in and behaviour of myoglobulin after removal from muscle. J. VON MÓCSY (Math. nat. Anz. ung. Akad. Wiss., 1936, **54**, 899—903; Chem. Zentr., 1937, i, 1721).—The absorption spectrum of oxymyoglobulin contains α-, β-, γ-, and ϕ-bands with max. at 5812·8 (horse) or 5813·5 (dog), 5430, 4150, and 2885 A. Reduced myoglobulin gives bands at 5400—5850 and 4270 A. The spectrum of meta-myoglobulin is strongly influenced by p_H. Strong myochromogen bands occur at 5800—5670 A. and in the ultra-violet, and weaker bands at 5450—5390 A. Spectroscopic detection of myoglobulin or oxymyoglobulin in blood serum in cases of paralytic myoglobinæmia requires very sensitive apparatus. Higher concns. occur in the urine, but owing to the presence of reducing substances in horse urine the urinary passages yield reduced and meta-myoglobulin while oxymyoglobulin is formed in the kidneys. Myoglobulin decomposes rapidly on exposing the urine to air, vitiating accurate spectrographic determination; the total myoglobulin is determined by the Fe content. A. J. E. W.

Mol. wt. of crystalline myogen. N. GRALÉN (Biochem. J., 1939, **33**, 1342—1345; cf. Baranowski, A., 1939, III, 826).—At p_H 5—9·5, cryst. myogen A (from rabbit muscle) is stable but dissociates outside these limits. Determination of sedimentation const. and n of solutions and sedimentation equilibrium experiments show that cryst. myogen is a single mol. species of mol. wt. 15×10^4, a val. which falls into Svedberg's multiple system (cf. *ibid.*, 785). Conc. urea solutions causes dissociation of myogen mols. into halves. W. McC.

Viscosity concentration constant of fibroin sols.—See A., 1939, I, 522.

(xxiv) ENZYMES.

Anti-group enzyme in human saliva and salivary glands. G. HARTMANN (Compt. rend. Soc. Biol., 1939, **131**, 254—258).—The anti-group action of the saliva and salivary glands obtained aseptically from cadavers is enzymic in nature. H. G. R.

Spectroscopic studies on enzyme systems. T. R. HOGNESS (Proc. Sixth Conf. Spectros., 1938, 31—37).—The use of the spectrograph in following intermediate stages in enzyme processes is illustrated with the investigation of cytochrome *c*. Problems in which the application of the spectrograph may prove of val. are also mentioned. A. J. M.

Effect of deficiencies in copper and iron on the cytochrome-oxidase of rat tissues. M. O. SCHULTZE (J. Biol. Chem., 1939, **129**, 729—737).—Cu is essential for the formation and maintenance of cytochrome-oxidase activity of rat liver and heart. The activity is not diminished and may even be increased in severe anæmia, provided that Cu is fed. P. G. M.

Determination of cytochrome *c* in tissues. A. FUJITA, T. HATA, I. NUMATA, and M. AJISAKA (Biochem. Z., 1939, **301**, 376—390).—The tissue is ground with water, N-H_2SO_4 and aq. 2N-NH_3 are added, hæmoglobin is removed by adding aq. $(NH_4)_2SO_4$ and warming, acetone is added, and the cytochrome, which passes into the middle of the 3 layers formed, is dissolved in 0·1N-NaOH and so oxidised. The extinction coeffs. of this solution before and after conversion of the cytochrome into the reduced form are photometrically determined (absorption at 550 mμ.) and the cytochrome content is calc. from the difference between the coeffs. The cytochrome *c* contents of organs and tissues and of tumours are recorded. Viscera and tumours have low cytochrome *c* contents (less than 0·15—6·78 mg.-%) but that of muscle, especially skeletal and cardiac, is usually high (up to 83 mg.-%), red muscle having a much higher content than white. A modification of the method of determination gives approx. quant. results when applied to unicellular organisms. W. McC.

Spectroscopic determination of cytochrome *c* and its distribution in some mammalian tissues. R. JUNOWICZ-KOCHOLATY and T. R. HOGNESS (J. Biol. Chem., 1939, **129**, 569—574).—Cytochrome *c* is determined spectroscopically by measuring the absorption at 3 λλ and correcting for the presence of

hæmo- and myo-globin. It is present in greatest amount in active muscle tissue, and least in fœtal and carcinoma tissue. E. M. W.

Absorption spectrum of further purified cytochrome *c*. H. THEORELL and Å. ÅKESSON (Science, 1939, **90**, 67; cf. A., 1936, 879; 1937, 200).—Purification of cytochrome *c* (0·34% Fe) in a Tiselius electrophoretic apparatus under controlled p_H removes a colourless component and leaves a cytochrome with 0·43% of Fe, corresponding with a mol. wt. of 13,000. The purified material, unlike the original, migrates in the electric field as a homogeneous substance at all p_H vals. investigated. The purification has no influence on the absorption spectrum in the visual region. The oxidised cytochrome shows different bands depending on p_H. A re-investigation of the visual part of the spectrum shows new absorption bands and the existence of 4 different forms of ferricytochrome *c*, which change reversibly by changing the p_H. L. S. T.

Enzymic studies of sarcoma. I. Effect of cytochromes and of diaphorase on the dehydrogenation of lactate and succinate. H. VON EULER and H. HELLSTRÖM (Z. physiol. Chem., 1939, **260**, 163—168).—A method of purifying cytochrome *b* is described. Cytochrome *a* has not been obtained quite free from *b*. Appreciable O_2 uptake by the system succinate–succinic acid dehydrogenase (dehydrogenase from dialysed extract of Jensen sarcoma) occurs only if the *a*, *b*, and *c* components of cytochrome and cytochrome oxidase are present. Glutathione has no catalytic effect on the O_2 uptake. In presence of all the cytochrome components and of the oxidase, diaphorase, which is an essential constituent of the system, activates O_2 consumption by the system and by the lactate–lactic acid dehydrogenase (dehydrogenase from extract of Jensen sarcoma) system. When diaphorase and all the cytochrome components together with the oxidase are present, O_2 uptake by extract of Jensen sarcoma to which *l*(+)-lactate is added is almost the same as when muscle extract replaces the sarcoma extract. Little or no O_2 is taken up if *d*(−)-lactate is used. W. McC.

***l*-Malic dehydrogenase and codehydrogenase of *B. coli*.** E. F. GALE and M. STEPHENSON (Biochem. J., 1939, **33**, 1245—1256).—Washed suspensions of *B. coli* contain malic dehydrogenase, which is obtained in the press-juice after crushing. It requires co-enzyme I (liberated on boiling *B. coli* suspensions) and co-enzyme factor (diaphorase) for its action with methylene-blue. The "index of co-enzyme saturation" varies with the age of the culture (max. after 10—14 hr. growth), this variation being prevented by the addition of co-enzyme I, ribose, and/or nicotinamide to the medium. *l*-Malate is oxidised aërobically by *B. coli* (inhibited by 0·0001M-CN′), taking up 4 O per mol. It is also oxidised aërobically by the extracted dehydrogenase, taking 1 O per mol. to produce oxalacetic acid, in presence of the system malate–dehydrogenase–co-enzyme I–co-enzyme factor–CN′–methylene-blue–O_2. The dehydrogenase is reversible, reduced co-enzyme I being oxidised in the presence of oxalacetic acid. H. G. R.

Liver enzymes. VII. Aldehydrase or aldehyde mutase? L. REICHEL and W. BURKART (Z. physiol. Chem., 1939, **260**, 135—140; cf. A., 1936, 894).—Aldehydrase obtained by the authors' method (fractional pptn from aq. extracts of liver with 60—80% alcohol) contains no alcohol dehydrogenase and dehydrogenates aldehyde only after suitable intermediate acceptors (lactoflavin, flavoprotein) have been added. The activity of the aldehydrase is not increased by treatment with $Ca_3(PO_4)_2$ or by dialysis and pptn. with acetone–ether mixture. No evidence for the presence of an aldehyde mutase is found. The oxidase of Dixon's preps. (A., 1938, III, 1047) is probably alcohol dehydrogenase. W. McC.

Amine-oxidase. K. BHAGVAT, H. BLASCHKO, and D. RICHTER (Biochem. J., 1939, **33**, 1338—1341; cf. A., 1938, III, 147).—Mammalian skeletal muscle contains little or no amine-oxidase but the enzyme is widely distributed in other parts (*e.g.*, pancreas, heart, spleen, thyroid and adrenal glands, testicle, uterus). Pig's heart contains much more of the enzyme than does sheep's heart and other large species differences are observed. Aliphatic and aromatic amines of the type $R{\cdot}CH(CH_3){\cdot}NH_2$ are not attacked by the enzyme, and, amongst aromatic amines having OH in the ring, the rate of oxidation by the enzyme decreases as the no. of hydroxyl replaced by methoxyl groups increases. W. McC.

Methylene-blue-reducing system of Palestine orange peels investigated by Thunberg's method. L. FRANKENTHAL (Enzymologia, 1939, **6**, 287—306).—Fresh or boiled neutral orange juice or pulp reduces methylene-blue at 37° both in presence and absence of PO_4'''. Freshly prepared juice from peel reduces dichlorophenol-indophenol only slightly as compared with fruit juice, and this slight reducing power is almost lost after a day. Presence of PO_4''' is essential for reduction of methylene-blue, and increase of p_H accelerates reduction. In presence of PO_4''', K malate and, especially at p_H 6·5, methylglyoxal are activators: citrate inhibits. In absence of PO_4''', little reduction occurs except in presence of succinate, citrate, or malate. Codehydrogenase and yellow enzyme singly or together have no marked effect on the rate of reduction of methylene-blue by peel juice. Glucose, fructose, sucrose, and amino-acids in 0·005M. concn. do not affect the rate of reduction, whilst conc. solutions of glycine accelerate the rate but only in presence of PO_4''' or org. acids. KCN activates in presence or absence of PO_4''' and at all p_H vals. $Na_4P_2O_7$, KF, and iodoacetic acid have no effect. The power to reduce methylene-blue is considerably decreased by boiling the peel juice, but KCN and glycine function as activators. In addition to ascorbic acid, the juice contains a second reducing factor which appears to be dehydroascorbic acid and its irreversible conversion product, diketogulonic acid. Dehydroascorbic acid can be detected in peel juice and considerable additional ascorbic acid is present in the juice after incubation with glutathione. J. N. A.

Formation of acetaldehyde from succinic acid by quinone catalysis as model reaction. P. MARQUARDT (Enzymologia, 1939, **6**, 329—332).—

Treatment of 1% aq. succinic acid with adrenaline and dimedon in a closed vessel for a week at 35—36° in total darkness leads to the formation of acetaldehyde, which is isolated as its condensation product with dimedon. The decomp. is thus obtained without the use of tissue enzymes or cell-free tissue extracts. J. N. A.

Enzymic synthesis of cocarboxylase in animal tissues. S. Ochoa (Biochem. J., 1939, **33**, 1262—1270).—Liver slices, brei, or "dispersions" from avitaminotic pigeons (brain and muscle preps. are less active) convert added vitamin-B_1 into cocarboxylase in amounts which do not greatly surpass the normal cocarboxylase content of the tissue. The synthesis is dependent on active respiration (optimum p_H 8·5), an essential part of the enzyme system being sol.; it is inhibited by iodoacetic acid and unaffected by NaF. Sol. enzymes which destroy cocarboxylase in absence of respiration are found in the highest concn. in those organs which exhibit the highest synthetic capacity. H. G. R.

Distribution of aconitase. K. P. Jacobsohn and J. Tapadinhas (Compt. rend. Soc. Biol., 1939, **131**, 647—649).—The presence of aconitase is demonstrated in rice, wheat, maize, rye, and *B. coli*. H. G. R.

Placental enzymes. Presence of aconitase in placenta. D. P. da Cunha and K. P. Jacobsohn (Compt. rend. Soc. Biol., 1939, **131**, 649—651).—The presence of aconitase in placenta washed free from blood is demonstrated. H. G. R.

Structural specificity of aconitase. K. P. Jacobsohn and M. Soares (Compt. rend. Soc. Biol., 1939, **131**, 652—654).—Aconitase hydrolyses *cis*-aconitic acid but is inactive towards methylmaleic acid. H. G. R.

Activation and inhibition of choline-esterase. L. Massart and R. Dufait (Enzymologia, 1939, **6**, 282—286).—Choline-esterase (from horse serum), is activated by $Ca^{\cdot\cdot}$. It loses some of its activity on dialysis but complete activity is regained after addition of $Ca^{\cdot\cdot}$. Mg and Mn are almost as active as Ca, Sr is less active, whilst Ba has practically no effect. Cd is inactive, and Cu and Co inhibit. Oxalate also inhibits but its action is annulled by an equiv. amount of Ca. In 0·02M. solution, NaF, Na oxalate, Na citrate, KCN, Na_3AsO_3, $Na_4P_2O_7$, and KCNS produce 63, 52, 59, 23, 87, 74, and 8% inhibition, respectively. J. N. A.

Hydrolysis of glutathione by blood serum. G. E. Woodward (Biochem. J., 1939, **33**, 1171—1174).—An enzyme, similar to kidney anti-glyoxalase, is present in human serum. It hydrolyses SS-glutathione with formation of cystine. There is no difference between the enzyme content of normal and pathological (cancer etc.) sera. P. G. M.

Papain. C. V. Ganapathy and B. N. Sastri (Biochem. J., 1939, **33**, 1175—1179).—SS-Papain will hydrolyse gelatin and egg-albumin but not peptone at an optimum p_H 3·6—3·8. HCN and glutathione activate it by widening the p_H range so that it can hydrolyse peptone. SH-Papain has a p_H range of action of 3—5, and its hydrolysis of peptone is inhibited by maleic acid. Iodoacetic acid irreversibly inactivates both forms of the enzyme. P. G. M.

Enzymic system of peas. E. V. Arzichovskaja and N. S. Spiridonova (Compt. rend. Acad. Sci. U.R.S.S., 1939, **23**, 155—157).—The later is the variety of pea, the greater is the synthetic activity of the protease and the amount of protein formed. The ratio protein-N : total N is nearly the same in various grain peas but in sugar peas is much greater for late than for early varieties. The increase of carbohydrate in peas is inversely proportional to the increase in the amount of protein. Increase in the synthesis of carbohydrates is accompanied by increased oxidising activity of ascorbinase, but there is no relation between the latter and the earliness of grain peas. J. N. A.

Co-substrates in proteolysis.—See A., 1939, II, 470.

Determination of starch-liquefying power [of amylases]. S. Friedmann (Enzymologia, 1939, **6**, 307—320).—In the determination of the liquefying power of a malt by Chrzaszcz's method (A., 1933, 313), not only is the dextrinifying amylase determined, but up to approx. 75° the saccharifying amylase contributes to the reaction. The latter has the power of saccharifying starch paste. The dextrinifying amylase always produces at a definite temp. and in unit time during 15 min. the same amount of maltose. The dextrinifying amylase in malt is active at 89°, the optimum temp. for saccharification is 61°, and the optimum temp. for liquefaction is 54—61°; for the saccharifying amylase, the corresponding temp. are 68°, 50—54°, and 47—54°, respectively. The ratio of dextrinifying to saccharifying amylases in barley-malt extract is 6 : 4, the liquefying power being approx. the sum of those of the two amylases. J. N. A.

Formation of amylases, maltase, and protease in saké-koji.—See B., 1939, 875.

Carbohydrases. II. Enzymic hydrolysis of *p*-nitrophenol-β-galactoside. K. Aizawa (Enzymologia, 1939, **6**, 321—324).—p-*Nitrophenol-β-galactoside*, m.p. 170°, $[\alpha]_D^{20}$ −74·7° in water (*tetra-acetate*, m.p. 138°), is hydrolysed by taka-diastase and emulsin, the optimum p_H being 5 and 6, respectively. Rabbit liver, lung, kidney, spleen, and testicle, but not muscle, contain β-galactosidase, max. hydrolysis of the galactoside occurring with liver. Extracts of these organs do not hydrolyse *p*-nitrophenol-β-glucoside, whilst yeast extract hydrolyses only the glucoside. J. N. A.

Enzyme–protein complex which phosphorylates glycogen. Reversible enzymic synthesis of glycogen. W. Kiessling (Biochem. Z., 1939, **302**, 50—72; cf. A., 1939, III, 519).—*C*-Protein (isolation described) warmed for 30 min. at 38—40° with aq. $(NH_4)_2SO_4$ (10% saturation) yields a ppt. which catalyses the esterification of glycogen with inorg. PO_4''' but does not hydrolyse Cori's ester. Dissolved in aq. $(NH_4)_2SO_4$ (10% saturation), brought to p_H 5·5 with 0·1N-acetic acid, and kept at 0° for 20 min., the ppt. obtained being treated twice or thrice in the same way, the protein yields a solution

which hydrolyses the ester but does not catalyse the esterification. The isolation of glycogen and glucose-1-phosphoric acid from the equilibrium mixture obtained when *C*-protein acts on mixtures of inorg. PO_4''' and the acid or glycogen respectively is described, evidence being given that no co-enzyme is required for esterification or hydrolysis. *C*-Protein catalyses, equally readily, phosphorylation of polysaccharides composed of chains of glucose residues but not that of other polysaccharides. Binary mixtures of *C*- with *A*- and *B*-protein act on glycogen in essentially the same way as do *A*- and *B*-protein alone when glucose or hexose monophosphate is used instead of glycogen. W. McC.

Phosphatase activity of teeth and skin of the lamprey. Comparative biochemistry of ossification. J. Roche and J. Collet (Compt. rend., 1939, **208**, 2111—2112).—The phosphatase activity of the skin and teeth of *Petromyzon marinus*, L., is very low unlike that in selachians and teleosts in which calcification occurs in these structures (cf. A., 1939, III, 488). The absence of phosphatase activity is a biochemical argument that the cyclostomes are not fishes. J. L. D.

Specificity and action of sweet-almond phosphatase. I. Action on *n*-propyl and *iso*propyl phosphates. J. Courtois and P. Denis (Enzymologia, 1939, **6**, 325—328).—The phosphatase hydrolyses *n*- and *iso*-propyl phosphates, the optimum p_H being 5·4 to 5·6. Whatever the p_H or concn. of substrate, the *n*- is hydrolysed more rapidly than the *iso*-propyl ester. The affinity of the phosphatase for the two esters is only slight, and is considerably less than that observed for the corresponding glycerophosphates. J. N. A.

Phosphatase test as applied to ice cream.—See B., 1939, 1072.

Rates of enzymic hydrolysis of phosphoric esters. E. J. King and G. E. Delory (Biochem. J., 1939, **33**, 1185—1190).—The enzymic hydrolysis of ethyl, α- and β-glycero-, tolyl, phenyl, nitrophenyl, and bromophenyl phosphates has been studied. The phosphatase prep. used was obtained from dogs' fæces, and the general behaviour of these esters accords with the conception that the more strongly acid is the ester the greater will be the affinity of the enzyme for it. P. G. M.

Activity of phosphoglyceric dehydrogenase in umbilical cord of human fœtus at full term. G. Minniti (Biochim. Terap. sperim., 1939, **26**, 217—225).—The dehydrogenase system (cf. Antoniani, A., 1935, 897) involved in the conversion of phosphoglyceric into phosphopyruvic acid (Embden–Meyerhof scheme) could not be detected in the cord. The absence of the enzyme appears to be related to the low val. of internal respiration : glycolysis ratio for the cord tissue. F. O. H.

Nature, action, and importance of co-enzymes. K. Silbereisen (Woch. Brau., 1939, **56**, 265—270).—A lecture.

Gentiopicrin.—See A., 1939, II, 469.

(xxv) MICROBIOLOGICAL AND IMMUNOLOGICAL CHEMISTRY.

Radio races of yeast. II. Physiological characters of some radio races of a wine yeast. A. Lacassagne, M. Schoen, and P. Beraud (Ann. Ferm., 1939, **5**, 129—152; cf. A., 1939, III, 789).—Radio races have been derived from *Saccharomyces ellipsoideus*, var. Chambertin, by the activity of α-rays from Po. The modified morphological and physiological characters induced have been retained over a prolonged period, the intensity of change in general increasing with the degree of irradiation. Growth and rate of fermentation are retarded, but respiration is always increased, particularly on gelatin media. Aërobic fermentation is usually reduced, but anaërobic fermentation, which is diminished in liquid media, is always increased on solid media. The cells appear to contain increased cytochrome, and the reduction in fermentation appears to be a consequence of increased respiration, which is itself due to a modification of electronic carriers. No clear relationship can be traced between the rate of growth and the aërobic fermentation. Growth of radio races and the original yeast in the same culture results in loss of the characters of the former ; hence the possibility of replacing native yeasts by radio races in wine making is doubted. I. A. P.

Reproduction in yeasts and artificial cross-breeding of yeast under the microscope. Ø. Winge (Dansk Tidsskr. Farm., 1939, **13**, 189—204).—In both *Saccharomyces* and *Zygosaccharomyces* fusion of two haploid cells to give a zygote is always necessary for spore formation. Haploid cells from *Sacch.* spores fuse at once to give the normally diploid vegetative cells, but in *Zygosacch.* the primary haploid cells are the normal vegetative form and only yield zygotes immediately prior to spore formation. Thus since spore formation is never parthenogenetic, the spores from a single cell (usually 4) are not necessarily identical. A technique for disrupting the spore case and growing the spores separately has been developed. Differences are detected from the characteristic shapes of the free-growing colonies. Wide dissimilarity between growths from spores from the same cell has been found with the purest *Sacch.* strains. Hybridisation has been achieved by bringing two single spores of different strains into contact. The hybrid colony grows well, but secondary colonies from hybrid spores usually show poor growth unless the ancestral strains were similar, although *Z. priorianus* and *S. cerevisiæ* have been crossed successfully. Progress is being made in the development of improved commercial strains. M. H. M. A.

Oxidation–reduction potential of culture media containing vital dyes in presence of yeasts. R. Gautheret (Compt. rend., 1939, **208**, 1840—1842; cf. A., 1938, III, 847; 1939, III, 872).—The min. r_H vals. reached at different p_H during reduction of dyes in presence of *Saccharomyces cerevisiæ* in culture media (Schoen's solution, peptone–glucose, and KH_2PO_4) are studied. With Nile- and cresyl-blues the limiting r_H is reached rapidly (5 min. at high p_H).

With neutral-red and Janus-green the r_H fall is slower and the min. val. depends to a greater extent on the medium. The change in r_H is not entirely due to excretion of the leuco-base by the yeast; it is more rapid when the dye is retained for a longer period by the yeast cells. The absorbed dye acts as a carrier of H between the cells and the surrounding medium. The yeast does not absorb or reduce K indigotin-disulphonate, but addition of Nile-blue causes immediate reduction. Janus-green is too strongly held to act as a H carrier. Neutral-red is scarcely reduced, in spite of the fall in r_H. High p_H favours rapid reduction. A. J. E. W.

Accumulation of vital dyes by yeast cells as an adsorption phenomenon. A. GUILLIERMOND, R. GAUTHERET, and A. BUCHY (Compt. rend. Soc. Biol., 1939, **131**, 408—411).—The process is complex. When the dye (*e.g.*, Nile-blue) is fixed on the cytoplasm in the living cell, the absorption curves for the living and dead cells are identical. When the dye accumulates in the vacuole and only slightly on the cytoplasm, the curves for the living and dead cells are different. H. G. R.

Simplified isolation of glutathione from yeast. E. F. SCHROEDER, V. COLLIER, jun., and G. E. WOODWARD (Biochem. J., 1939, **33**, 1180—1181).—900 g. of pressed baker's yeast are stirred with 2·5 l. of acetone for 10 min. and filtered; the residue is suspended in 1350 c.c. of water, 200 g. of kaolin are added, and the whole is filtered, yielding a clear light yellow filtrate. The remaining procedure is essentially that of Hopkins (A., 1929, 1491). It is possible to complete pptn. of Cu^I glutathione within 1 hr. The yield of glutathione (98% purity) is 0·5—0·75 g., approx. 50% of that present in the original yeast. P. G. M.

Effects of pantothenic acid on respiratory activity [of yeast]. E. F. PRATT and R. J. WILLIAMS (J. Gen. Physiol., 1939, **22**, 637—647).—Pantothenic acid in minute amounts stimulates the respiration of yeast. Thiamin was the most effective of other substances tried, but less effective than pantothenic acid; its action was in some ways antagonistic to that of the acid. Liver extract (Lilly's No. 343) stimulates respiration and growth of yeast to a much higher level than that found with known compounds. Pantothenic acid has an activating effect on fermentation by dialysed yeast maceration juice, and on respiration by apple and potato tissue. D. M. N.

Chemical induction of genetic changes in fungi. C. THOM and R. A. STEINBERG (Proc. Nat. Acad. Sci., 1939, **25**, 329—335).—In the presence of $NaNO_2$, a strain of *Aspergillus niger* produced certain of the same types of variant in successive experiments. These variants essentially duplicated others discovered in nature. $NaNO_2$ also caused changes in *A. amstelodami* but not in *Penicillium caseicolum*. Various org. compounds failed to induce similar genetic variations. E. M. W.

Metabolic products of *Aspergillus ochraceus*. III. Synthesis of *iso*ochracin.—See A., 1939, II, 479.

Effect of *Saprolegnia diclina* on oxidation-reduction potential of culture media with added dyes. R. GAUTHERET (Compt. rend. Soc. Biol., 1939, **131**, 616—618).—The effect is due to excretion of reducing substances rather than to accumulation of the dye by the fungus. H. G. R.

Actinomyces-like organism associated with a food-poisoning outbreak. B. D. CHINN (Food Res., 1939, **4**, 239—244).—The organism, apparently present in fish roe, is described in detail. E. C. S.

Nitrogen requirements of *Euglena anabaena*, var. *minor*. R. P. HALL (Arch. Protistenk., 1938, **91**, 465—473).—Gelatin, asparagine, or glycine will support the growth of *E. anabaena* in suitable salt media. Photo-meso- or -meta-tropic growth occurs according to the nature of the medium. A. G. P.

Isolation of larvæ of *Trichinella spiralis* for preparation of antigen for immunological reactions in trichinosis. H. TSUCHIYA (J. Lab. clin. Med., 1939, **24**, 1207—1208).—The muscle is ground up and strained through gauze, and the larvæ are sieved off and washed. C. J. C. B.

Bactericidal effect of extract of a soil bacillus on Gram-positive cocci. R. J. DUBOS (Proc. Soc. Exp. Biol. Med., 1939, **40**, 311—312).—Autolysed cultures of the bacillus contain a substance which kills Gram-positive cocci and protects mice against 100,000 fatal doses of pneumococci. It is non-dialysable, heat-labile, and inactivated by acid. V. J. W.

Type "B" anti-influenzal rabbit serum for therapeutic purposes. H. E. ALEXANDER (Proc. Soc. Exp. Biol. Med., 1939, **40**, 313—314).—Serum of rabbits immunised with *H. influenzæ* organisms proved beneficial in influenzal meningitis in children. V. J. W.

***Phytomonas tumefaciens*. I. Lipins. Composition of the phosphatide.** W. B. GEIGER, jun., and R. J. ANDERSON (J. Biol. Chem., 1939, **129**, 519—529).—Bacteria grown on media containing glycerol or sucrose contain 2% of lipins containing 44% of phosphatide or 6% of lipins containing 64% of phosphatide respectively. The phosphatides consist of equal parts of lecithin and kephalin and contain a large amount of unsaturated high mol. wt. fatty acids which differ according to the medium. H. G. R.

Specific nutritive requirements of *Clostridium acetobutylicum* (Weizmann). II. C. WEIZMANN and B. ROSENFELD (Biochem. J., 1939, **33**, 1376—1389).—The synthetic power of *Cl. acetobutylicum* is limited. One of the essential growth factors is biotin, in addition to asparagine, and it cannot be replaced by aneurin, nicotinic acid, etc. A third as yet uncharacterised factor, present in maize mash, is necessary for full nutrition of the organism. (Cf. A., 1937, III, 224.) P. G. M.

Decomposition of citric acid by *Betacoccus cremoris*. J. VAN BEYNUM and J. W. PETTE (J. Dairy Res., 1939, **10**, 250—266).—In acidified milk *B. cremoris* produces acetic acid, CO_2, diacetyl, acetoin, and $\beta\gamma$-butylene glycol, but at a neutral reaction only acetic acid and CO_2 are produced. Although

acetoin is found in both aërobic and anaërobic cultures, diacetyl is formed only when O_2 is present. Acetoin may be reduced to the glycol, especially under less acid conditions. It is suggested that 1 mol. of citric acid yields 2 mols. of CO_2, 1—1·5 mols. of acetic acid, and 0·5—0 mol. of aroma compounds, the actual nos. depending on the acidity. When pyruvic acid was added to milk freed from citric acid, acetic acid, CO_2, and aroma compounds were formed, and it is concluded that this substance is an intermediate, citric acid being decomposed to pyruvic and acetic acids and CO_2. Diacetyl does not arise by direct oxidation of acetoin but by the action of O_2 in the aldehyde condensation reaction. J. G. D.

Nutritional requirements of the lactic acid bacteria. J. G. Davis (J. Dairy Res., 1939, **10**, 186—195).—Yeast autolysed for 6 days was generally superior to beer wort and malt, potato, lucerne, carrot, tomato, clover, and bean extracts, although beer wort and malt were sometimes best for hetero-fermentative types. The latter therefore, require growth factors other than vitamin-B_1, -B_2, etc. In addition lucerne and clover appeared to contain sp. gas-producing factors for the heterostreptococci. Doubling the amounts of -B_1, -B_2, and cocarboxylase did not affect the rate of growth of starter organisms. Sucrose was superior to maltose but never to glucose, whilst citrate had no effect. The growth-activating effect of heating sugars and yeast together in milk could only be observed with the more fastidious types. J. G. D.

Specificity of action of lactic acid bacteria on phosphoglyceric acids. H. Katagiri and S. Murakami (Biochem. J., 1939, **33**, 1257—1261).—Optical specificity was observed in the decomp. of phosphoglycerates by the *d*- and *l*-acid-former strains (no specificity for the *dl*-acid-formers) of lactic acid bacteria. Racemisation of 2- and 3-phosphoglyceric acids is produced by racemiase. H. G. R.

Growth-promoting system of lactic acid bacteria. E. F. Möller (Z. physiol. Chem., 1939, **260**, 246—256; cf. Snell *et al.*, A., 1939, III, 100).—Tests with media composed of glucose, cysteine, other amino-acids, salts, and known growth-promoters show that other growth factors for the bacteria exist (and are present in caseinogen hydrolysate) in addition to adermin (A., 1939, III, 927) and pantothenic acid. The active constituent of the growth-factor *F* is possibly pantothenic acid. The factor *G* increases by 50% the max. growth obtained with all the remaining factors. The factor *H* probably consists of biotin, nicotinic acid, and a factor *H'*. No growth occurs if biotin is absent. Nicotinic acid promotes moderate growth and *H'* produces approx. 100% growth. Factor *G* also contains some *H'*. The optimal dose of cryst. biotin methyl ester is approx. 4 times that of crude biotin probably because the pure ester is hydrolysed only with difficulty by the bacteria. The activity of the pure ester and of crude biotin is increased by hydrolysis. Unsaponified crude biotin contains an inactive form of *H'*. Growth is promoted by adenine (replaceable by guanine) but not by xanthine, hypoxanthine, or various pyrimidines. *meso*-Inositol as a substitute for nicotinic acid has only 0·1% of the activity of the acid. Cozymase replaces adenine + nicotinic acid and dinucleotides other than cozymase are probably also essential for growth. Adermin has 500 times the activity of its methyl ether and 4-deoxyadermin has only 30—40% of the activity of adermin. 4 : 5-Bisdeoxyadermin, nicotinamide, and other simple pyridine and quinoline derivatives do not replace adermin. Various strains of the bacteria have different requirements for growth. W. McC.

Anaërobic dissimilation of citric acid by *Aërobacter indologenes*. C. R. Brewer and C. H. Werkman (Enzymologia, 1939, **6**, 273—281).—Anaërobic fermentation of citric acid does not occur at p_H below 6·0—6·3, and the products are mainly formic, acetic, and succinic acids, CO_2, and small amounts of $\beta\gamma$-butylene glycol, acetoin, ethyl alcohol, and lactic acid. There are no significant changes in the rates of formation of the products except in that of formic acid, which decreases during the later stages of fermentation. When Na citrate is fermented without control of p_H and CO_2 is removed by N_2, the medium becomes alkaline, whilst an unbuffered glucose fermentation under similar conditions becomes acid. Fermentation of a mixture of citric acid and glucose can occur at p_H below 6·0, when the glucose is fermented much more rapidly than the citrate, but the products from the latter are the same as in absence of glucose. Manometric determinations show that cells of *A. indologenes* grown in glucose media in absence of citrate attack the latter only slightly, whilst cells grown in citrate exhibit an almost normal glycolytic activity. AsO_3''', HSO_3', and iodoacetate completely, and NaF partly, inhibit the fermentation of citrate. Activation occurs with malate, fumarate, and, to a greater extent, malonate. *l*-Malic, fumaric, oxalacetic, and pyruvic, but not aconitic, tricarballylic, citraconic, itaconic, α-hydroxy*iso*butyric, succinic, and acetic acids, are fermented by *A. indologenes*. A scheme for the fermentation of citric acid by this organism is suggested and discussed. J. N. A.

Metabolism of arginine by *B. coli*. S. Akasi (Acta Sch. med. Univ. Kioto, 1938—39, **22**, 433—443).—Arginine is metabolised by the *coli* bacteria in varying degree. 4 groups can be recognised according to the ability of metabolising arginine and forming putrescine from it. 21 out of the 54 groups used belonged to groups I and II and could be employed for the formation of putrescine from arginine. The ability to metabolise arginine has no relation to the ability to digest sugar. A method for the identification of groups metabolising arginine is described. E. R.

Effect of *p*-aminobenzenesulphonamide on *B. coli*. S. Luria (Compt. rend. Soc. Biol., 1939, **131**, 429—432).—0·2—0·3% sulphanilamide has an immediate bacteriostatic and a delayed bactericidal action. With the second culture on a treated medium, the organism is sensitised but on further culture, it becomes accustomed to the drug. H. G. R.

Biochemical data on blood and urine of sheep in the botulism areas of Western Australia. E. J. Underwood, R. J. Harvey, and A. B. Beck (Austral. J. Exp. Biol., 1939, **17**, 193—203).—Determinations of blood- and urine-p_H, and blood-alkali reserve, -sugar, -hæmoglobin, -total plasma-N,

and -non-protein N were made on merino sheep in the botulism areas. No correlation was found between any of these vals. and the onset or disappearance of the pica. D. M. N.

Concentration of sulphanilamide in blood and milk of cattle and its effect on *Brucella abortus* and streptococcal infections of the bovine udder. W. T. Miller, C. K. Mingle, F. M. Murdock, and J. O. Heishman (J. Amer. Vet. Med. Assoc., 1939, **94**, 161—171).—15 mg. of sulphanilamide per 100 c.c. in milk and blood plasma could be maintained in cows by an initial dose of 0·4 mg. per kg. followed by 0·15—0·2 mg. per kg. at 12-hr. intervals. This concn. was without effect on *B. abortus* infection in the udder or on the agglutination titre of the blood. Similar treatment of two cows with chronic streptococcal mastitis resulted in the complete recovery of one of them. There was a decrease in appetite and milk production in treated animals. E. G. W.

Susceptibility and immunity of different animals to diphtheria toxin. T. L. Hwon (Acta Sch. med. Univ. Kioto, 1938—39, **22**, 423—432).—By subcutaneous injection, rabbits were killed within 12 hr. by 1 M.L.D., and by intracutaneous injections rabbits and guinea-pigs showed positive results up to a 1 in 10,000 and 5000 dilution, respectively. Rats and mice showed no reaction to intracutaneous injection and by subcutaneous injection rats could resist a dose of toxin 500 times that which is fatal to guinea-pigs, and mice could resist a dose 1800 times that fatal to guinea-pigs. Passive immunisation in rabbits and guinea-pigs produces 1 unit of antitoxin in 24—48 hr. Active immunisation of rats produces a blood antitoxin unit of $\frac{1}{2}$—$\frac{1}{5}$, when 2 injections were made. With mice, if only two injections were made, the antitoxin unit reached $\frac{1}{100}$ 2 weeks after injection, and $\frac{1}{2}$ three days after the injection, if 3 injections were made. Rabbits tended to retain their immunity comparatively longer than guinea-pigs and mice. E. R.

Biochemical characters of *Endodermophyton indicum* (Castellani, 1911). L. Grigoraki and R. David (Compt. rend. Soc. Biol., 1939, **131**, 594—596).—A slightly active casease and a very active trypsin are present, there being little action on carbohydrates or glycerol. H. G. R.

Inactivation of the toxin of *B. œdematiens* by ascorbic acid. J. Catz (Compt. rend. Soc. Biol., 1939, **131**, 618—620).—The toxin is inactivated in 24 hr. at 37° in acid or neutral medium and cannot be reactivated by dialysis. H. G. R.

Diffusion of gelatinase of *B. perfringens* A during growth in various liquid media. E. Pozerski and A. Guélin (Compt. rend. Soc. Biol., 1939, **131**, 427—429).—The addition of gelatin to a liquid medium aids the diffusion of the gelatinase. H. G. R.

Chemo-immunological studies on the soluble specific substance of *Pneumococcus*. IV. Capsular polysaccharide of type XIV *Pneumococcus* and its relationship to the blood group *A* specific substance. W. F. Goebel, P. B. Beeson, and C. L. Hoagland (J. Biol. Chem., 1939, **129**, 455—464).—The polysaccharide is isolated by fractional pptn. from autolysates of the organism. It is ash-free and dissolves in water to give a clear, practically neutral solution of low η. It is non-diffusible, free from protein, and contains 2% of N (none of which is free amino-N), but no P, S, methoxyl, uronic acids, or pentoses. It is not pptd. by $CuSO_4$, $UO_2(NO_3)_3$, neutral and basic Pb acetate, and $AgNO_3$. $Ba(OH)_2$ and tannic acid cause partial pptn. Hydrolysis with N-H_2SO_4 yields acetic acid, glucosamine, and galactose, the ratio acetylglucosamine : galactose being 3 : 1. Glucose is not present. Solutions of the polysaccharide react in a dilution of $1 : 4 \times 10^6$ in homologous immune horse and rabbit sera. In many of its properties it resembles the blood group *A* sp. substance, but it has not the nitrogenous component of the latter. The similarity between the two substances is also exhibited immunologically, for with type XIV anti-pneumococcus horse serum more than 50% of the total anti-body reactive with the polysaccharide is precipitable by the blood group *A* sp. substance. J. N. A.

Change in amino-oxidation following dissociation of *Staphylococcus aureus*. M. D. Webster (Proc. Soc. Exp. Biol. Med., 1939, **40**, 289—292).—*S. aureus* and the dissociate *S. albus* oxidise glycine, serine, and alanine equally. *S. aureus* oxidises only the natural isomeride of proline but *albus* oxidises both isomerides equally. V. J. W.

***Staphylococcus epidermis albus*. Cultural and immunological reactions of large and small colony types.** E. Meyer (J. Lab. clin. Med., 1939, **24**, 1146—1150).—All these strains are related to each other, but the large colony strains are more highly antigenic, have wider antigenic relationships, and are more active biochemically than the small colony strains. C. J. C. B.

Activating effect of different mixtures of energy factors, in optimum doses, on the growth of a *Staphylococcus* and of an abiotic yeast. A. Sartory, J. Meyer, and A. Netter (Compt. rend., 1939, **208**, 1931—1933; cf. A., 1939, III, 530).—The action of vitamin-B_1 (2·5 μg.) and nicotinic acid (0·13 mg.) together on the growth of *S. pyogenes aureus* and *Debaryomyces mucosus* is equal to the sum of their individual effects. Purified "biotin" markedly increases the effects of the vitamins (cf. Kögl, A., 1938, III, 766) which can replace Devloo's sterol (A., 1938, III, 696) to some extent. *S. pyogenes aureus* grows best in presence of biotin + sterol + -B_1; *D. mucosus* on biotin + sterol + nicotinic acid. J. L. D.

Production of hæmolysin and peroxide by hæmolytic streptococci in relation to non-hæmolytic variants of group *A*. A. T. Fuller and W. R. Maxted (J. Path. Bact., 1939, **49**, 83—94).—The variants of group *A* hæmolytic streptococci which give non-hæmolytic greenish colonies on the surface of aërobic blood agar differ from their hæmolytic variants in their later production of hæmolysin and in their lower hæmolytic titre. If all reducing sugar is removed from the blood agar, if extra catalase is added to it, or if they are grown anaërobically, these green variants yield beta hæmolytic zones. Peroxide

removes the hæmolysin from cultures of streptococci owing to a growth-inhibiting effect and has no appreciable effect on hæmolysin itself. During this action the peroxide is decomposed. Other growth inhibitors cause a similar decrease in hæmolysin titre. C. J. C. B.

Effect of tryptic digestion on toxicity and antigenicity of the tetanus toxin broth. D. C. LAHIRI (Indian J. Med. Res., 1939, **26**, 889—896).—Tetanus toxin broth loses its toxicity and antigenicity when digested with trypsin. H. B. C.

Importance of oxidation phenomena in the inactivation of toxins *in vitro*. L. VELLUZ (Compt. rend. Soc. Biol., 1939, **131**, 602—603).—Tetanus or diphtheria toxin can be destroyed by contact with auto-oxidisable substances (cysteine, homogentisic acid, bilirubin) *in vitro*. H. G. R.

Proteolysis of anti-tetanus serum. F. MODERN and G. RUFF (Rev. Soc. argent. Biol., 1939, **15**, 108—112).—Anti-tetanus serum was treated with pepsin at p_H 4 and 48° for 17 hr.; the p_H was then adjusted to 8·2—8·3 and papain added; after 20 hr. at 48° the antitoxic fraction was pptd. with 22% Na_2SO_4. The antitoxic power of the original serum was 7000 units per g. of protein, of the serum ppt. with Na_2SO_4 12,000, of the serum digested before pptn. 22,500 units. Erepsin treatment proved unsatisfactory. The euglobulin fraction was greatly decreased by pepsin–papain digestion. J. T. L.

Purification of antitetanus serum by [enzymic] digestion. G. SANDOR and R. RICHOU (Compt. rend. Soc. Biol., 1939, **131**, 461—464).—Peptic digestion at p_H 4·0 for 16—18 hr. followed by adsorption on $Al(OH)_3$ gel yields 75—80% of the antitoxic protein conc. 2·5—3·0 times. H. G. R.

Effect of lactic acid on acid-resistant bacteria. T. VOICULESCU (Compt. rend. Soc. Biol., 1939, **131**, 435—436).—Various types of *B. tuberculosis* are resistant to 15% lactic acid for 60 min. Lactic acid may replace H_2SO_4 for isolation of acid-resistant bacteria. H. G. R.

Antigenic structure of human and bovine tubercle bacilli. W. SCHAEFER (Compt. rend., 1939, **209**, 129—131; cf. A., 1939, III, 528, 877).—The bovine bacillus contains sp. protein antigens which give rise to sp. protein antibodies in the serum of immunised horses, rabbits, and man. Antibodies are not elaborated in horse and rabbit serum in response to the human tubercle bacillus. Killed human and wrinkled bovine bacilli produce only lipin and polysaccharide antibodies in the guinea-pig, whilst smooth bovine bacilli produce protein antibodies which react with the antigen of the bovine and human bacillus. The tuberculin reaction is closely linked with the formation of these protein antibodies. J. L. D.

Comparative study of old tuberculin and purified protein derivative. R. M. SEIDEMAN (Amer. J. Hyg., 1939, **30**, B, 1—10).—3 solutions of old tuberculin and 3 batches of purified protein derivative, in solution, powder, and tablet form, were tested simultaneously by intradermal injections into sensitised guinea-pigs. 1 : 1000 and 1 : 5000 dilutions of full-strength tuberculin and 1% of the protein derivative were equiv. on a guinea-pig skin-test potency basis. Tests on young adults, using doses of 1 : 10,000 and 1 : 1000 dilutions of tuberculin and 1 : 50,000 and 1 : 200 of the protein, showed that the initial dose of protein derivative was more sensitive than that of tuberculin although the latter showed a greater total no. of reactors. Using laboratory animals and dilutions of 1 : 100 to 1 : 100,000 the comparability of full-strength tuberculin and 1% protein derivative was confirmed at 1 : 1000. Above this dilution the latter showed the greater sensitivity, while below tuberculin was more sensitive. Conventional doses of both products stored at room temp. and in a refrigerator remained stable for 18 days. First-strength dilutions of the pptd. protein derivative stored in the icebox for 7—12 weeks were more reactive than fresh dilutions. B. C. H.

Comparative study of xanthoproteic reaction and the presence of tuberculin in cultures of human and bovine *B. tuberculosis* on Sauton's medium. F. VAN DEINSE (Compt. rend. Soc. Biol., 1939, **131**, 185—187).—A parallelism is observed between the intensity of the xanthoproteic reaction and the production of tuberculin, although there is a lag in the former with the bovine type. H. G. R.

Total loss of virulence of *B. typhi-murium* administered intraperitoneally after prolonged culture in presence of lecithin. B. S. LEVIN and L. OLITZKI (Compt. rend. Soc. Biol., 1939, **131**, 447—450).—After 250 cultures on lecithin broth, the organism becomes avirulent. H. G. R.

Unsuccessful attempts to re-establish the pathogenic action of *L* strains of *B. typhi-murium*. B. S. LEVIN and L. OLITZKI (Compt. rend., 1939, **208**, 2026—2028; cf. A., 1939, III, 632).—The virulence of the original strain could not be introduced into the non-toxic *L* strain. J. L. D.

Leucocidal activity of typhoid filtrate. E. W. DENNIS and H. SENEKJIAN (Amer. J. Hyg., 1939, **30**, B, 21—36).—Filtrates of 24-hr. cultures of *Bact. typhosum* grown in NaCl infusion broth were leucocidal. The active factor passed through Berkefeld N, Chamberland L3, and Seitz EK filters, and could be demonstrated by the Neisser–Wechsberg method or by mixing the toxic filtrate with heparinised whole blood. The toxic action was primarily on the polymorphonuclear granulocytes. The leucocidin is pptd. by cold acetone and by 3 vols. of 95% alcohol but not by $(NH_4)_2SO_4$; it is not dialysable. A purified specimen of leucocidin was non-protein in nature. It was unstable in solution, but when conc. by pptn. with alcohol could be stored dry for 12 months. The typhoid filtrate was partly inactivated at 85° for 1 hr., and wholly inactivated at 100° for 2 hr. Slight protection against the leucocidin was obtained by the admixture of Felix's antityphoid immune serum. Leucocytes from vaccinated human beings were unaffected, although leucocytes from non-immune human blood were susceptible. Evidence suggests that typhoid leucocidin is antigenic. B. C. H.

Precipitation of the sugar–lipin antigen-*O* of *B. typhosus* by rabbit's immune serum. P.

GRABAR and G. HORNUS (Compt. rend. Soc. Biol., 1939, **131**, 244—246).—The ratio of the (completely pptd.) antibody-N to the wt. of antigen in the sp. ppt. is a const. H. G. R.

Hæmolysis by vibrios. A. N. GOYLE (Indian J. Med. Res., 1939, **26**, 611—624).—The rate of production of hæmolysin by vibrios varies in different strains. The red blood cells show great species difference in their sensitiveness to the hæmolysin, and this was not correlated with their cholesterol or lecithin content. The vibrio hæmolysin is filterable, destroyed by heating at 56° for 10 min., rapidly lost if kept at 37°, but remains active for long periods if kept in cold storage. Quant. cross-neutralisation of the various hæmolysins with the same immune serum, prepared against a hæmolytic strain, suggests that the hæmolysins are homologous. H. B. C.

"Phases" of the lysogenic function. Successive action of lysozyme and trypsin on a lysogenic organism. E. WOLLMAN and (MME.) E. WOLLMAN (Compt. rend. Soc. Biol., 1939, **131**, 442—445).—No liberation of bacteriophage occurs after the successive action of lysozyme and trypsin on lysogenic *B. megatherium* and the bacteriophage corpuscles do not exist as such in the lysogenic organism. H. G. R.

"Phases" of the lysogenic function of sensitive bacteria. E. WOLLMAN and (MME.) E. WOLLMAN (Compt. rend. Soc. Biol., 1939, **131**, 614—616).—Only homologous bacteriophages fixed specifically on sensitive bacteria are destroyed by lyzozyme. H. G. R.

Antigenic power of *B. subtilis* bacteriophage fixed on aluminium hydroxide. Precipitant action of antibacteriophage serum. R. WAHL and S. LEWI (Compt. rend. Soc. Biol., 1939, **131**, 211—213).—The neutralising power of serum prepared from bacteriophage adsorbed on $Al(OH)_3$ and eluted with saline is greater than that with the bacteriophagic lysate from broth or a synthetic medium. H. G. R.

Inactivation and reactivation of bacteriophage by (A) mercuric chloride and (B) formaldehyde. R. WAHL (Compt. rend. Soc. Biol., 1939, **131**, 234—237, 237—240).—(A) There is a limit in the concn. of $HgCl_2$, depending on the type of phage, below which inactivation does not take place and above which it is progressive. Reactivation does not depend on the concn. of $HgCl_2$ used for inactivation and differs with the type of phage.

(B) The effects of formaldehyde are similar to those of $HgCl_2$. *B. subtilis* phage is more resistant to inactivation than that of staphylococcus and reactivation will not take place above a certain concn. of formaldehyde. H. G. R.

Adsorption of the bacteriophage of *B. subtilis* on aluminium hydroxide. R. WAHL and S. LEWI (Compt. rend. Soc. Biol., 1939, **131**, 591—593).—Adsorption is best carried out at p_H 6·3, the antigenic power being increased and the lytic power conserved. H. G. R.

Recent results of yellow fever research and the pathogenesis of virus diseases. F. O. HÖRING (Klin. Woch., 1939, **18**, 1013—1017).—A review. E. M. J.

Migration of ætiologic agent of fowl leukosis when subjected to electrophoresis. C. D. LEE and H. L. WILCKE (J. Amer. Vet. Med. Assoc., 1939, **94**, 178—186).—Using selected chicks of known breeding history it was found possible to produce any of the pathological conditions grouped under the term "fowl leukosis" by injection of a cell-free filtrate of fresh ovarian lesions. The behaviour of the ætiological agent on electrophoresis resembles that of the known filterable viruses: at p_H 4·01—6·01 it migrates to the cathode, between p_H 7·01 and 9·01 to the anode. Electrophoresis was successful in freeing the agent from associated protein. The isoelectric point was between p_H 6·01 and 7·01. E. G. W.

Influence of ultra-sound waves on poliomyelitis virus and production of immunity. M. KASAHARA (Klin. Woch., 1939, **18**, 971—972).—9 monkeys (*Macacus cynmolgus*, Linné) injected with poliomyelitis virus which had been treated with ultra-sound waves were infected 17 to 47 days later with untreated virus; 5 animals remained healthy and 4 died with typical paralyses. E. M. J.

Isolation of the poliomyelitis virus from contaminated material. P. LÉPINE (Compt. rend. Soc. Biol., 1939, **131**, 573—574).—The stool is emulsified with water and ether, and the aq. layer centrifuged and concd. H. G. R.

Effect of trypsin on virus of trachoma. L. A. JULIANELLE (Proc. Soc. Exp. Biol. Med., 1939, **40**, 222—223).—The virus was rendered non-infectious to monkeys by 30 min. tryptic digestion. V. J. W.

Presence of a neutralising factor in the cutaneous lesion provoked by the intradermal inoculation of vaccinal virus. J. VIEUCHANGE and F. GALLI (Compt. rend., 1939, **208**, 2031—2033).—Extracts of the inflammatory focus, skin, lymph glands, and spleen of rabbits which were vaccinated up to 4 days previously contained "neutralising" substances. The serum contained none. J. L. D.

Adaptation of the Henriot-Huguenard ultracentrifuge to biological research. A. GRATIA (Bull. Acad. Méd. Belge, 1939, **6**, 19—35).—An account of the apparatus and technique used, and the results obtained on some viruses, bacteriophages, and antibodies. H. B. C.

Ultravirus and fluorescence. Behaviour towards ultra-violet irradiation in a fluorescent medium. (A) Trypanosomes, bacteria, and enzymes. (B) Bacteriophages. (C) Elementary vaccinal corpuscles. C. LEVADITI, LE-VAN-SEN, and L. REINIÉ. (B) C. LEVADITI and I. LOMINSKI. (C) C. LEVADITI, I. LOMINSKI, L. REINIÉ, and LE-VAN-SEN (Compt. rend. Soc. Biol., 1939, **131**, 480—482, 482—483, 483—486).—(A) Trypanosomes are destroyed in 3½—4½ min. by ultra-violet irradiation in a fluorescent medium, whilst *Spirillum serpens*, *B. coli communis*, and trypsin are much more resistant.

(B) The lytic activity of bacteriophages is very slowly destroyed on irradiation.

(C) Elementary vaccinal corpuscles are rapidly

destroyed by irradiation, being more related to the trypanosomes than to bacteria or enzymes. H. G. R.

Ultravirus and fluorescence. Action of ultra-violet irradiation on the activity of the vaccinal virus in presence of fluorescent dyes (fluorochromes). J. GIUNTINI and L. REINIÉ (Compt. rend. Soc. Biol., 1939, **131**, 633—635).—Inactivation takes place if the dye absorbs in the ultra-violet and can be absorbed on the corpuscles. H. G. R.

Accumulation of tobacco mosaic virus in plants deprived of nitrogen. V. L. RISCHKOV and V. A. SMIRNOVA (Compt. rend. Acad. Sci. U.R.S.S., 1939, **23**, 95—97).—When tomato plants infected with the tobacco virus are deprived of N, formation of the virus protein still occurs, and the amount of protein in starving plants is not less than that in plants with a normal supply of N, the virus protein being formed at the expense of the normal plant proteins. Infection with virus does not retard the development of plants supplied with N, but diseased plants are far more affected than normal plants by N deficiency. J. N. A.

Paracrystals of tobacco mosaic virus. N. N. KLEMPARSKAJA (Compt. rend. Acad. Sci. U.R.S.S., 1939, **23**, 98—100).—Crystals from an infected tomato plant stain very badly or not at all, but after fixing they stain well with basic or acid dyes. No structural differences in the crystals can be observed. When a suspension of the crystals in 20% aq. $(NH_4)_2SO_4$ is mixed with a serum sp. with regard to the virus, agglutination of the crystals rapidly occurs. The reaction does not occur when a serum sp. to proteins of a normal plant or sera of agglutinant bacteria are used. The sp. serum is adsorbed by the crystals and their physico-chemical properties are altered. They are insol. in water after dialysis, but their behaviour to staining is not affected. Non-sp. agglutination is produced by 0·01—1% tannin or N-HCl, when the crystals are again rendered insol. A non-sp. reversible agglutination is also produced by Na citrate and tartrate, Na_2SO_4, and 70% $(NH_4)_2SO_4$, but after dialysis the crystals dissolve on dilution. J. N. A.

Tobacco ring spot virus. W. M. STANLEY (J. Biol. Chem., 1939, **129**, 405—428).—The isolation of the virus from the leaf juice of diseased Turkish tobacco plants by differential centrifuging is described. The virus has a sedimentation const. of 115×10^{-13}, isoelectric point at p_H 4·7, sp. gr. 1·57, mol. wt. $3{\cdot}4 \times 10^6$, and diameter 19 mμ. It yields isotropic pellets on centrifuging and exhibits no double refraction of flow. It is the smallest of the viruses and is quite unstable compared with tobacco mosaic virus. It contains approx. 40% of nucleic acid which gives a negative reaction for deoxy-sugars and a positive pentose test. The virus gives a sp. precipitin reaction with its antiserum. Heating to 64°, treatment with HNO_2 or with 36% urea in 0·01M-PO_4''' at p_H 7, keeping at room temp. in aq. solution or at p_H above 9 or below 6 causes denaturation and inactivation. The same effect is produced by freezing solutions containing no extraneous material, but more or less protection is afforded by the presence of electrolytes, plant pigments, or nutrient broth. One pptn. of the virus with 30% $(NH_4)_2SO_4$ at 4° causes marked inactivation. Solutions in 0·01M-PO_4''' buffer are relatively stable, but there is a marked increase in η and fairly rapid inactivation in aq. solution. The optimum conditions for storing the virus are in 0·01M-PO_4''' buffer at 4° and p_H 7. J. N. A.

Isolation of virus from plants recovered from tobacco ring spot disease. W. M. STANLEY (J. Biol. Chem., 1939, **129**, 429—436).—Recovered, apparently normal leaves of Turkish tobacco plants diseased with tobacco ring spot virus contain about 1 part of virus in 500,000 parts of fresh green leaf, whilst leaves with many necrotic lesions from the same plants contain 1 in 80,000. No difference in properties of the virus isolated from the two types of leaf can be detected. Recovery from the disease is due to an adjustment by the host involving a mechanism by which the level of concn. of the virus is lowered to approx. one sixth that of the former level. Immunity appears to result from the persistence of a low concn. of virus in plants recovered from the disease. J. N. A.

Preparation and characterisation of aucuba mosaic virus. E. PFANKUCH and G. A. KAUSCHE (Biochem. Z., 1939, **302**, 77—83; cf. A., 1939, III, 336, 729).—The isolation of the virus from infected tobacco plants (isolation from tomato plants is more difficult) is described. The sp. turbidities of solutions of the virus are recorded and compared with those of tobacco mosaic and potato *X* virus; reactions with Au sol are described. The results demonstrate the close similarity between the aucuba and tobacco mosaic virus. The mol. of the aucuba virus, however, is possibly heavier or longer and narrower than that of the tobacco virus. W. McC.

Acid-resistant bacilli in vipers. T. VOICULESCU (Compt. rend. Soc. Biol., 1939, **131**, 583—585).—Three strains of acid-resistant organisms have been isolated from diseased organs of vipers, two of which are pathogenic to guinea-pigs. H. G. R.

Urea-splitting organisms in urine. L. THOMPSON and T. L. SCHULTE (Proc. Staff Mayo Clin., 1939, **14**, 361—364).—A description of a medium devised to estimate the ability of bacteria to utilise urea, with brief conclusions as to its val. A. M. G.

Production of porphyrins by bacteria. A. JAKOB (Klin. Woch., 1939, **18**, 1024—1028; cf. A., 1939, III, 793). E. M. J.

Variability produced in bacteria irradiated with radon. S. GHELELOVITCH (Compt. rend., 1939, **208**, 1942—1943).—Four strains of sarcinæ obtained by irradiating a parent strain with radon (cf. A., 1939, III, 622) reproduced like forms when subcultured, but mutants were sometimes encountered. Strains of the parent, apparently unaltered by irradiation, show mutants when subcultured frequently. J. L. D.

Biological method of distinguishing micro-bacteria. A. I. KORENJAKO (Compt. rend. Acad. Sci. U.R.S.S., 1939, **23**, 185—186).—The method depends on the property of some actinomycetes

("antagonists") which check the development of certain sporing bacteria (including microbacteria) without suppressing that of non-sporing species including nodule bacteria. The culture to be examined is transferred evenly over the surface of an agar medium, treated in two or three places with the antagonist, and incubated for 1—2 days. In the case of microbacteria a sterile zone is formed around the actinomycetes. J. N. A.

Single-dip stain for direct examination of milk. J. Broadhurst and C. Paley (J. Amer. Vet. Med. Assoc., 1939, **94**, 525—526).—A method for direct bacterial count in milk smears combines, in one procedure, fat extraction, fixing, and staining. The stain consists of an alcoholic solution of basic fuchsin and methylene-blue containing H_2SO_4 and tetrachloroethane. Improved contrast results in higher counts than by the usual methods. E. G. W.

Modification of Brown anaërobe jar. J. H. Brewer (J. Lab. clin. Med., 1939, **24**, 1190—1192).—The modifications are: the electrical current does not pass through the jar, no rheostat or lamp bank is required, the jar connects directly to the 110-v. current, and the lid is redesigned to conserve space and aid in handling. C. J. C. B

Reactivation of formolised neurovaccine by dialysis. F. Galli and J. Vieuchange (Compt. rend. Soc. Biol., 1939, **131**, 473—475).—Neurovaccine, inactivated by formaldehyde, can be reactivated by dialysis at p_H 6·2. H. G. R.

Mechanism of the reactivation of formalin-inactivated neurovaccine by dialysis. J. Vieuchange and F. Galli (Compt. rend. Soc. Biol., 1939, **131**, 627—629).—Reactivation by dialysis will not take place if the cerebral tissue is dialysed prior to inactivation, which is due to fixation of formalin not directly on to the virus but on to accompanying protein material autolysed during dialysis. H. G. R.

Artificial production of neurovaccinal strains. C. Levaditi (Compt. rend., 1939, **208**, 1944—1945).—A mixture of neurovaccine and dermovaccine of low encephalitic potency when cultured on the chorio-allantoidal membrane of an egg produces a neurovaccine of high encephalitic potency. J. L. D.

Antitoxic power of viper contra-antigen. J. Loiseleur (Compt. rend. Soc. Biol., 1939, **131**, 180—182).—The antitoxic action is due to combination between dissociated groups of the contra-antigen and the venom and is annulled by previous combination of the former with protein. H. G. R.

(xxvi) PLANT PHYSIOLOGY.

Physiological ontogeny in the tobacco plant. I. Drifts in dry weight and leaf area in relation to phosphorus supply and topping. A. H. K. Petrie, R. Watson, and E. D. Ward (Austral. J. Exp. Biol., 1939, **17**, 93—122).—Increase of P supply to optimum caused increase in dry wt.; excess of P caused depression. Topping (*i.e.*, removal of the stem apex prior to inflorescence expansion) caused increase in dry wt., particularly of the roots and leaves. Optimum P supply and topping both led to increase in leaf area. Data for relative growth rate, unit leaf rate, and leaf wt. and area ratios are given and discussed. D. M. N.

Physiological ontogeny in plants and its relation to nutrition. VI. Analysis of the unit leaf rate. R. F. Williams (Austral. J. Exp. Biol., 1939, **17**, 123—132; cf. A., 1938, III, 626).—The net assimilation rate is expressed per unit of protein-N (the best available measure of the cytoplasmic content) in the leaves. The drift in assimilation rate so expressed is closely related to certain climatic factors. Various treatments have similar effects on net assimilation and respiration rates of the leaves, when these quantities are expressed on a protein-N basis. D. M. N.

Effect of fixation of selenium by Cruciferæ on the quantitative relationships between certain elements in these plants. M. F. Taboury and O. C. Viau (Compt. rend., 1939, **209**, 121—123).—The ash of fully grown plants of *Sinapis alba*, *Raphanus sativus*, and *Brassica nigra* which have absorbed Se from the soil contains 0·0007%, 0·0017%, and 0·001% of Se, respectively. In *S. alba* the amounts in the leaves, roots, and stems decrease in this order. Spectroscopic examination of the ash shows that control and treated plants contain Li, Na, K, Ca, Sr, Ba, Mg, Mn, Fe, and Al. In *S. alba* the Fe content of Se-treated plants is less than in controls, whilst *R. sativus* absorbs less Fe, Mn, Mg, and Li, but more Ca, Sr, and Ba, than do controls. Se does not alter the relative amounts of the elements present in *B. nigra*. J. L. D.

Metabolism of nitrogen in leaves of buckwheat. H. B. Vickery, G. W. Pucher, R. Schoenheimer, and D. Rittenberg (J. Biol. Chem., 1939, **129**, 791—792).—By administration of NH_4Cl containing ^{15}N in the culture solution, a rapid replacement of N of the leaf-protein with the isotope occurs, suggesting that the active cell-protein reacts with simple N compounds of the cell sap. Similar observations have been made on the tobacco plant. P. G. M.

Oxidation of thiols and ascorbic acid in the latex of papaya. C. V. Ganapathy and B. N. Sastri (Proc. Indian Acad. Sci., 1939, **10**, **B**, 81—87; cf. A., 1938, III, 633).—A thermolabile system in the latex maintains the thiol compounds in a reduced form and these protect the ascorbic acid from oxidation by hexoxidase or Cu. E. M. W.

Adhesion of potato-tissue cells as influenced by pectic solvents and precipitants. C. J. Personius and P. F. Sharp (Food Res., 1939, **4**, 299—307; cf. A., 1939, III, 106).—Using tubers kept at 4·4° for at least 4 months, extensive decrease in cell adhesion of potato tissue was effected by keeping at 65° in aq. NH_4 oxalate, Na citrate, NaF, or lactic acid at p_H below 3; definite but not extensive decrease occurred in water, potato juice, or 0·2N-NaCl or -KCl, and no decrease in 0·2N-$BaCl_2$, -$CaCl_2$, -$MgCl_2$, or -$SrCl_2$. The decrease is due to removal of Ca (partly reversed by $CaCl_2$) and hydrolysis of protopectin. E. C. S.

Effect of oxidation–reduction potential of the medium on proteolysis of barley. P. Reiss

(Compt. rend. Soc. Biol., 1939, **131**, 539—541).—Proteolysis is max. in a moderately reducing medium, the rate decreasing in an oxidising or strongly reducing medium. H. G. R.

Light intensity and dry-matter production in plant communities. P. FILZER (Ber. deut. bot. Ges., 1939, **57**, 155—164).—The linear relationship between dry matter production and light supply is not generally applicable in plant communities. Root competition introduces a flattening of the light-production curve. In the absence of root competition the curve rises substantially uniformly up to the zone of optimum light intensity. In *Oxalis* (shade plant) and *Senecio fuchsii* (light plant) the optimum zone of light intensity for abs. dry matter production coincides with that for max. % dry matter in the fresh wt., although the position of the light optimum differs in the two cases. A. G. P.

Changes in content of growth substances [in plants] due to interruption of dormancy. L. M. JARKOVAJA (Compt. rend. Acad. Sci. U.R.S.S., 1939, **23**, 88—91).—Interruption of dormancy in potato tubers by removal of the skin causes an increase in the amounts of growth substance-*A* and bios. The amounts of these substances vary in different parts of the tuber. In dormant tubers the cambial region contains the largest amount of bios. After interruption of dormancy the content of bios in this zone is nearly doubled, in the eyes it is nearly trebled, but the amounts in the central and peripheral regions are almost unaltered. The max. amount of -*A* occurs in the eyes. Interruption of the rest period in lilac buds by heating in water at 35° for 12 hr. causes an increase in -*A* and bios, whilst in trifoliate orange shoots under the same conditions the amount of bios is increased. J. N. A.

Point of origin of the blossom-inducing stimulus. R. H. ROBERTS and B. E. STRUCKMEYER (Science, 1939, **90**, 16).—Experiments with different plants using different techniques to obtain blossoming indicate that the stem of the plant and a leaf-formed hormone-like substance are both concerned in the appearance of blossoms. L. S. T.

Effect of benzenated water on development of rootlets of white lupin. M. MEITÈS (Compt. rend. Soc. Biol., 1939, **131**, 424—425).—Immersion of the plantules in water saturated with benzene stimulates formation and growth of the rootlets. H. G. R.

(A) Effect of cocaine hydrochloride on cells of *Elodea canadensis*. Evidence of a "potential toxic action." (B) Influence of the acid combined with cocaine on its effect on the leaves of *E. canadensis*. J. RÉGNIER, R. DAVID, and S. BAZIN (Compt. rend. Soc. Biol., 1939, **131**, 227—228, 229—231).—(A) Treatment of leaf sections with cocaine hydrochloride produces refracting particles undergoing Brownian movement in the vacuoles and transient or complete cessation, according to the dose, of the protoplasmic flow, the latter exhibiting the "potential toxic action."

(B) The order of decreasing activity is phenylbutyrate, citrate, hydrochloride, and phenylpropionate, gluconate both for the physiological and "potential toxic" actions. H. G. R.

Wound hormones of plants. II. Isolation of a crystalline active substance. J. ENGLISH, jun., J. BONNER, and A. J. HAAGEN-SMIT (Proc. Nat. Acad. Sci., 1939, **25**, 323—329).—A cryst. dibasic acid, $C_{12}H_{20}O_4$, m.p. 165·5—166° (dimethyl ester, m.p. 30—31°), has been isolated from fresh bean pods. Cell division and enlargement take place in the tissue of the bean mesocarp under the influence of the pure substance but the activity is greatly enhanced in the presence of co-factors possessing little activity themselves. Other active substances are probably present in the initial extract. E. M. W.

(xxvii) PLANT CONSTITUENTS.

Spectroscopic detection of rare earths in plants. B. F. SCRIBNER (Proc. Sixth Conf. Spectros., 1938, 10—13).—The method used in the spectroscopic detection of rare earths in concentrates from the ash of leaves by means of a grating spectrograph is described. In the case of hickory leaves, 11 rare-earth elements, accounting for 0·2% of the dry wt. of the leaf, were found. The occurrence of rare-earth elements in other plants has also been investigated. A. J. M.

Simultaneous quantitative determination of seven elements in grasses and legumes spectrographically. B. C. BRUNSTETTER, A. T. MYERS, H. L. WILKINS, and M. A. HEIN (Proc. Sixth Conf. Spectros., 1938, 14—19).—The simultaneous spectroscopic determination of Mg, Mn, Al, Cu, Fe, K, and Ca in air-dried grasses is described. In a series of grasses and legumes the following ranges of concn. calc. on a dry-wt. basis were found: Mg 0·17—0·42%, Mn 0·017—0·054%, K 1·7—5·1%, Cu 30—80 p.p.m., Al 0·03—0·19%, Fe 0·04—0·19%. A. J. M.

Spectrographic determination of elements present in traces in calcareous algæ (*Lithothamnium calcareum*). R. LAGRANGE and A. TCHAKIRIAN (Compt. rend., 1939, **209**, 58—59; cf. A., 1938, I, 280).—The ash, after removal of SiO_2 and the metals present in relatively large quantities, contains Ag, As, Cu, Ge, Be, Mn, Mo, Ni, Pb, Sb, Sn, Ti, V, W, and Zn. J. L. D.

Determination of molybdenum in plant materials. F. B. MARMOY (J.S.C.I., 1939, **58**, 275—276).—Sandell's method (cf. A., 1936, 1353) for the determination of Mo in rock samples is modified for use with plant materials. The sample is ashed, extracted with dil. HCl, and an aliquot is treated with KCNS and $SnCl_2$. The Mo thiocyanate is extracted with Et_2O and determined by colorimetric titration. Amounts of Mo down to 1 p.p.m. can be determined on a sample of 2 g. Since no preliminary separation as sulphide is necessary, the method is much more rapid and considerably cleaner than those used hitherto.

Diffusion of molybdenum in plants. D. BERTRAND (Compt. rend., 1939, **208**, 2024—2026).—The aërial portions of many flowering plants, particularly the Cruciferæ and the Leguminoseæ, contain

0·54—4·5 mg. of Mo per kg. dry wt. Many fruit and seeds contain Mo, particularly the strawberry and bean (53 mg. per kg. dry wt.). J. L. D.

Phytochemistry of *Kalmia angustifolia*, L. M. L. JACOBS and W. R. LLOYD (J. Amer. Pharm. Assoc., 1939, **28**, 408—412).—The air-dried plant (water 7·30, total ash 2·80—2·99, acid-insol. ash 0·407—0·634%) was extracted by light petroleum, ether, $CHCl_3$, and alcohol. An alcohol (carnaubyl?), hydrocarbon, sitosterol, ursolic acid, phloridzin (0·066), arbutin (0·93), phlobaphen, and tannin (6·51%) were isolated. F. O. H.

Possible formation of ethyl esters during fixation of plant tissues. A. GORIS and H. CANAL (Compt. rend., 1939, **209**, 125—127).—The leaves of *Paeonia officinalis* or *P. moutan* when boiled with ethyl or methyl alcohol containing $CaCO_3$ afford ethyl or methyl gallate, respectively. An acetone extract of the leaves contains neither gallate, but removes an acid, converted by alcohol–H_2SO_4 into a mixture of gallate and benzoate. When this mixture is hydrolysed the acids are liberated but cannot be separated by extraction with solvents; they are converted by boiling alcohols containing $CaCO_3$ into gallates, unlike gallic acid which does not react. J. L. D.

Constituents of *Sympetrum*. A. OGATA, S. HIRANO, and T. SATO (J. Pharm. Soc. Japan, 1939, **59**, 50).—*S. darwinianum* and *S. frequens*, extracted successively with ether, 95% alcohol, and $CHCl_3$, afford cholesterol, taurine, and *substances*, m.p. 85·5° and 93° (sinters at 88°). A. T. P.

Oil of kostus root. T. UKITA (J. Pharm. Soc. Japan, 1939, **59**, 80—82).—The oil, extracted by petroleum (b.p. below 50°), fractionated at 6 mm. pressure, affords palmitic acid, an *acid*, $C_{15}H_{22}O_3$, m.p. 118·5°, and a *lactone*, $C_{15}H_{18}O_2$, m.p. 60·5°. The new products on catalytic hydrogenation absorb 2 and 3 H_2, respectively. A. T. P.

Thelephoric acid in lichens.—See A., 1939, II, 479.

Betulic acid from *Cornus florida*, L.—See A., 1939, II, 484.

Sterols of rye-germ oil. S. W. GLOYER and H. A. SCHUETTE (J. Amer. Chem. Soc., 1939, **61**, 1901—1903).—Rye-germ oil contains α_1-, β-, γ-, and α_3-sitosterol, but not α_2-sitosterol or stigmasterol and little, if any, dihydrositosterol. α_3-Sitosterol, $C_{29}H_{48}O$, m.p. 142°, $[\alpha]_D^{23}$ +1·65° in $CHCl_3$, (*benzoate*, m.p. 167·5–168°, $[\alpha]_D^{28}$ +14·85° in $CHCl_3$), is isolated as m-*dinitrobenzoate*, m.p. 202·5—203°, $[\alpha]_D^{27}$ +15·35° in $CHCl_3$, contains two ethylenic linkings (BzO_2H), and, as does α_1-sitosterol, gives the Liebermann–Burchard (finally dark purple) and Salkowski (as for ergosterol), but not the Rosenheim, colour reactions. α_1- and α_3- are pptd. by digitonin. R. S. C.

Glycoside of *Persoonia salicina* fruits. J. W. CORNFORTH (J. Proc. Roy. Sci., New South Wales, 1939, **72**, 255—256).—The fruits of *P. salicina* contain arbutin unaccompanied by methylarbutin. Arbutin is not present in the fruit of *P. pinifolia*, R. Br. H. W.

Fruit of *Pittosporum undulatum*.—See A., 1939, II, 469.

Constitution of laminarin. Isolation of 2 : 4 : 6-trimethylglucopyranose.—See A., 1939, II, 409.

Mannonolactones from seeds of date palm (*Phœnix dactylifera*).—See A., 1939, II, 405.

Separation of membranes of starch grains in various crops. M. I. KNJAGINITSCHEV (Compt. rend. Acad. Sci. U.R.S.S., 1939, **23**, 92—94).—When starch grains are immersed in 30% aq. Na salicylate for 30—60 min. the membrane bursts and the contents dissolve, leaving the insol. membrane. Starch grains can be divided into three groups, (*a*) those from wheat (all species), rye, and barley which have thin membranes, (*b*) those from beans, cow pea, and round pea which possess moderately thick membranes, and (*c*) those from potato, rice, and sugar and wrinkled peas which have thick membranes. Because of the varying resistance of different starches towards the action of diastase the existence of an unknown enzyme which disrupts the membranes and is more or less sp. for any given genus or group of genera is postulated. J. N. A.

Condition of starch in potato at different stages of tuber ripening. F. C. JAGER and M. S. JAKULEV (Compt. rend. Acad. Sci. U.R.S.S., 1939, **23**, 491—494).—Starch granules develop rapidly in early-ripening potatoes. Potatoes of different dormancy habit are characterised by different formation of starch granules in the region of the eyes. E. M. W.

Composition of the cell wall of plants. II. Bast fibres of tree barks. R. S. HILPERT and W. KNACKSTEDT (Ber., 1939, **72**, [*B*], 1582—1588).—Determinations of C, H, methoxyl, and sometimes N are recorded for bast fibres of *Picea excelsa*, *Pinus silvestris*, *Taxus baccata*, *Ginkgo biloba*, *Thuja*, eucalyptus, *Fagus silvatica*, *Carpinus tatulus*, *Quercus pedunculata*, *Tiba ulmifolia*, *Acer campestre*, *Populus alba*, *Corylus arellana*, *Sambucus nigra*, and *Salix caprea*. With few exceptions the fibres contain less C and about as much H as the corresponding woods. The fibres of conifers contain relatively little methoxyl whereas about the same proportion is present in the fibres and woods of deciduous trees. There appears to be no relationship between the yields of lignin obtained from the bast fibres by the action of mineral acids and those obtained from the wood; in general the % of methoxyl of bast lignin is less than that of the wood lignin. The yield of pentosans from the fibre is sometimes higher, sometimes lower, than from the corresponding wood. The bast fibres of conifers are so greatly attacked by alkali that only a residue of 40—55% remains; methoxyl is increased in the residue but the elementary composition is otherwise unchanged. Apart from some swelling, the fibres remain intact. N in the fibres exceeds that in the wood but is much less than that in the leaves or sprouting portions of the plant. Cu–ethylenediamine does not appear to dissolve cellulose from the fibres but rather substances which form lignin with acids and behave otherwise in the same manner as the woods except from a quant. viewpoint. Generally

there is no indication of the presence of cellulose in the fibres. H. W.

Cell-wall constituents of soya bean. II. Constituents of seed coat. S. SASAKI and S. TŌ (J. Agric. Chem. Soc. Japan, 1939, **15**, 624—628; cf A., 1939, III, 110).—The seed consists of 85—90% of embryo and 5—10% of seed coat. Data are given for the amounts of pectin, hemicelluloses, crude fibre, α-, β-, and γ-celluloses, crude protein, crude oil, and ash in the seed coat. The latter consists mainly of pectin and cellulose. J. N. A.

Basic amino-acids of leaf proteins: methods of analysis. G. R. TRISTRAM (Biochem. J., 1939, **33**, 1271—1283).—Determinations of basic amino-acids by a modification of Block's adaptation (A., 1934, 1241) of Vickery's method compare favourably with Vickery's results after correction for arginine Ag and overall losses. When hydrolysed in the presence of furfuraldehyde-yielding carbohydrates, arginine is lost approx. in proportion to the amount of carbohydrate, histidine recovery is irregular (probably owing to difficulty of determination), and that of lysine is normal unless a large excess of carbohydrate is present. When N is less than 8% only lysine can be determined with accuracy. The base analyses of leaf proteins vary little with species and season. E. M. W.

Protein and other nitrogenous constituents of water melon seeds (*Citrullus vulgaris*). P. S. KRISHNAN and T. K. KRISHNASWAMY (Biochem J., 1939, **33**, 1284—1290).—The principal N constituents of the seeds are globulin 73·2, glutelin 9·4, water-sol. protein 6·3, and proteoses 3·5%. No urease activity is shown by the glutelin or globulin, but a protein with strong urease activity is pptd. from the aq. extract at p_H 4·5. The seeds contain no canavanine or citrulline and only traces of free arginine. E. M. W.

Plant phosphatides and lecithin. V. Phosphatide of lupins. W. DIEMAIR and K. WEISS (Biochem. Z., 1939, **302**, 112—120; cf. A., 1938, III, 251).—The proportions of kephalin and lecithin in the phosphatides of lupin seeds are approx. 26 and 74% respectively and the P : N ratio in the phosphatides is approx. 1 : 1. The isolation of the lecithin is described. It contains P 3·65, N 1·68, and total fatty acids 66% (ratio of solid to liquid fatty acids 1 : 5·3). Palmitic and arachidic (traces) constitute the solid and oleic, linoleic, and linolenic the liquid acids. The ratio of α- to β-glycerophosphoric acid in the lecithin, and probably in the kephalin also, is 1·54 to 1. W. McC.

Constituents of leaves of *Vaccinium uliginosum*, L. Flavone glucoside from *F. Uvae ursi* and *F. vaccinii vitis-idaea*, L. R. KAWAGUCHI, K. W. KIM, and K. MATSUSHITA (J. Pharm. Soc. Japan, 1939, **59**, 50—51).—Leaves of *Vaccinium uliginosum*, L., give *quercetin-3-galactoside* ($+1·5H_2O$), m.p. 235—237°, $[\alpha]_D^{24}$ −51·6°, converted by aq. HCl into quercitin and galactose. Methylation gives a product, m.p. 217—219°, decomposed by 3% aq. H_2SO_4 into 5 : 7 : 3′ : 4′-tetramethylquercitin. A. T. P.

Occurrence of cyanogenetic substances in edible members of the Cruciferæ. G. V. JAMES (Analyst, 1939, **64**, 500).—The literature on the subject is reviewed. E. C. S.

Biological determination of the glucosides of *Adonis vernalis*. F. MERCIER and S. MACARY (Compt. rend. Soc. Biol., 1939, **131**, 378—380).—Adonidoside is more toxic (intravenous injection) to guinea-pigs than adonivernoside, the heart being resistant to the toxic action of these glucosides. H. G. R.

Hydrolytic enzyme in the bark of *Periploca graeca*, L. T. SOLACOLU and G. HERMANN (Bull. Sci. pharmacol., 1936, **43**, 490—494; Chem. Zentr., 1937, i, 1961).—The bark contains *periplocibiase*, which hydrolyses *k*-strophanthoside and periplocoside but not *g*-strophanthoside or digitoxoside. A. J. E. W.

Saponins and sapogenins. X. Isolation of gitogenin from *Chlorogalum pomeridianum*. C. R. NOLLER, L. H. GOODSON, and M. SYNERHOLM (J. Amer. Chem. Soc., 1939, **61**, 1707—1710).—Material, m.p. 235—240°, isolated (Liang *et al.*, A., 1935, 673) from these bulbs is resolved by way of the acetates and benzoates into gitogenin and chlorogenin (cf. Marker *et al.*, A., 1939, II, 277), of which it is approx. an eutectic mixture. Anomalies in the m.p. and m.p. diagrams of mixtures are discussed. Isolation of the saponins is improved. R. S. C.

monoTropeposide from *Gaultheria Cuminginiana*, Vidal.—See A., 1939, II, 409.

Catechins from tea-leaves. W. B. DEIJS (Rec. trav. chim., 1939, **58**, 805—830).—From 8 samples of tea from different sources, *l-epi*catechin and cryst. gallocatechin were obtained; from 4 samples, catechin gallate was isolated. Attempts to separate the amorphous tannins were unsuccessful, and various colour reactions are described. Treatment with tannase yields gallic acid, which is also formed, but more slowly, by the action of H_2SO_4. There is no evidence of the presence of sugars in tannins. Amorphous tannins are largely catechin gallate. The determination of tannin in tea by formaldehyde–HCl is described and discussed. J. D. R.

Fermentation process in tea manufacture. IV. Tea-tannin and its fermentation products. C. J. HARRISON and E. A. H. ROBERTS (Biochem. J., 1939, **33**, 1408—1420).—The prep. of tea-tannin from green leaf is described. The product is not a true tannin; it is pptd. by quinine or Pb acetate, but incompletely by gelatin in the absence of acid and salt. It may be either a pyrocatechol or a pyrogallol derivative or a mixture of the two. Acid hydrolysis yields in some cases gallic acid but never glucose, facts which are explained by the assumed presence of the galloyl ester of *epi*catechin. Tea-tannin is therefore probably a mixture of *l-epi*catechin, gallocatechin, and their simpler condensation products. Tannins of made tea are more complex. Only the polyphenolic nucleus is oxidised during fermentation, the oxidised tannin then undergoing extensive condensation. P. G. M.

Vegetable tannins in Formosa.—See A., 1939, II, 484.

***iso*Flavones from soya bean.**—See A., 1939, II, 485.

Colouring matters of potato tubers afflicted with yellow spots. L. SCHMID and R. LANG (Monatsh., 1939, **72**, 322—326).—The yellow portions of the diseased potatoes contain about twice the normal amount of β-xanthophyll, some (?) α-carotene, and a *glucoside*, m.p. from about 180°, hydrolysed by HCl in methyl alcohol to quercitin and a sugar which gives glucosazone. R. S. C.

Distribution of anthocyanins in flowers, fruits, and leaves. W. J. C. LAWRENCE, J. R. PRICE, G. M. ROBINSON, and (Sir) R. ROBINSON (Phil. Trans., 1939, **230, B**, 149—178).—A review of previous results (cf. A., 1938, III, 1065). The anthocyanins present in permanently pigmented leaves, fruits, and flowers and the plants in which nitrogenous anthocyanins have been detected are tabulated. Cyanidin synthesis in the plant involves at least one stage less than that of either pelargonidin or delphinidin. Cyanidin structure is the one most readily produced in the plant, but delphinidin and pelargonidin occur in greater frequency in more highly developed plants. The distribution of the glycosidal types is considered. H. G. R.

Colloid chemistry of leaf and flower pigments. Precursors of anthocyanins. (SIR) R. ROBINSON and G. M. ROBINSON (J. Amer. Chem. Soc., 1939, **61**, 1605—1606).—Contrary to statements of Bancroft *et al.* (A., 1939, III, 110), the present authors do not envisage leucoanthocyanins as being always reduced anthocyanins nor as being the sole precursors of anthocyanins. The rôles of colloid association and co-pigments are stressed. R. S. C.

Variable colours of flower petals. G. M. ROBINSON (J. Amer. Chem. Soc., 1939, **61**, 1606—1607).—Colours in flowers due to one anthocyanin are variable according to the concn. of anthocyanin, the ratio of this concn. to that of co-pigments (tannins or flavonols), colloid association (probably with polysaccharides), virtual change of p_H due to surface phenomena (diffusion of mobile ions), dyeing of the fibre, or crystallisation of the pigment. The pigments, p_H, colour changes and their causes are noted for 11 flowers. R. S. C.

Anthocyanin of *Vitis hypoglauca*, F. v. M. J. W. CORNFORTH (J. Proc. Roy. Soc. New South Wales, 1939, **72**, 325—328).—The dried skins of *V. hypoglauca* are extracted with 2% HCl–methyl alcohol and the anthocyanin chloride is pptd. from the extract by ether. It is transformed into the picrate, identical with œnin picrate. The identity is further established by determining the "distribution no" of the corresponding chloride between amyl alcohol and 0·5% HCl and also by hydrolysis and identification of the liberated malvidin. Little or no delphinidin is present. The anthocyanin is therefore very largely œnin and in this respect *V. hypoglauca* resembles the cultivated grapes of Europe rather than the American grapes or the wild European grape. H. W.

Presence of leuco-anthocyanins in Criollo cacao. A. W. KNAPP and J. F. HEARNE (Analyst, 1939, **64**, 475—480).—Each component of the Criollo pod examined contained colourless substances which, on vigorous treatment with conc. HCl, yielded a mixture of brownish-red substances, from which cyanidin chloride was separated. A structure for the precursor of cyanidin chloride is suggested. E. C. S.

Carotenoids of fresh-water algæ. VII. Polyene pigments of the blue alga *Aphanizomenon flos-aquæ*.—See A., 1939, II, 481.

Hypericin, the photodynamically active pigment of *Hypericum perforatum*.—See A., 1939, II, 483.

Pigments in root-bark of *Celastrus scandens*.—See A., 1939, II, 484.

Bitter principles of the sap of *Lactuca virosa*. VII. Determination of the bitter taste of the bitter principles. G. SCHENCK and H. GRAF (Arch. Pharm., 1939, **277**, 257—261; cf. B., 1939, 884).—Comparisons of bitterness show that the sap contains bitter principles equiv. to 3% of lactucin or lactucopicrin. A. LI.

Isolation and identification of an ether-soluble alkaloid in *Coptis occidentalis*. T. D. ROWE (J. Amer. Pharm. Assoc., 1939, **28**, 422—427).—The plant yields coptine (which is differentiated from hydrastine and berberine by the crystal habit of the picrate). F. O. H.

Composition and preparation of curare. J. VELLARD (Compt. rend., 1939, **208**, 2104—2106).—A cold aq. extract of the root bark of a *Strychnos* is slowly evaporated (scum removed) to a syrup and allowed to set. In mammals and birds, this prep. induces cramp, tremors, and muscular spasm followed by paralysis and death from asphyxia. Other animals are killed more or less readily. Chronaxie measurements indicate the curarising action of the prep. J. L. D.

Alkaloids of *Arthrophytum leptocladum*, M. Pop.—See A., 1939, II, 456.

Constituents of derris root.—See A., II, 484.

(xxviii) APPARATUS AND ANALYTICAL METHODS.

New instruments and apparatus. J. SCHOLZ (Arch. exp. Path. Pharm., 1939, **192**, 544—548).—Description of: scissors for sternum of dogs and cats; a stromuhr for closed circulation; an electric time signal that marks different intervals with lines of different height; a modified arrangement for recording manometer tracings; thermostat heater and stirring arrangement. H. BL.

General purpose speedometer. G. H. BELL and J. B. DEV. WEIR (J. Physiol., 1939, **96**, 31—32P). J. A. C.

Micrometer curve measuring apparatus. J. A. E. EYSTER and J. S. HIPPLE (J. Lab. clin. Med., 1939, **24**, 1205—1207). C. J. C. B.

Device for faradic stimulation. A. L. DELAUNOIS (J. Physiol., 1939, **96**, 56—58P). J. A. C.

Micro-ultrafilter. D. KRASSNOFF (Compt. rend. Soc. Biol., 1939, **131**, 487—489).—The apparatus described may be used for 3—5 c.c. of liquid. H. G. R.

Simple distillation apparatus for chemical micro-methods. K. LANG (Klin. Woch., 1939, **18**, 913).—The apparatus described works with a closed system without a vac. and has so far been used for the micro-determination of residual N, urea, acetone, and lactic acid. E. M. J.

Determination of nicotinic acid in biological material. E. BANDIER (Biochem. J., 1939, **33**, 1130—1134).—The colorimetric method previously described (cf. A., 1939, II, 196) is fairly sp. Small amounts of pyridine, picolinic acid, etc. give no colour in the presence of KH_2PO_4. Results of analyses of ox and pig organs and some medicinal preps. are given. P. G. M.

Mounting thin celloidin sections.—See A., 1939, I, 539.

Quantitative separation of skeleton of small animals. V. SUBRAHMANYAN, J. DUCKWORTH, and W. GODDEN (Biochem. J., 1939, **33**, 1421—1424).—A proteolytic method is described for separating the whole rat skeleton for determinations of Ca, Mg, and P. The enzymes used are papain and trypsin, the latter possessing the advantage that pure preps. do not contain Ca. P. G. M.

Spectrograph as an analytical tool for medical use. H. R. KREIDER (Proc. Sixth Conf. Spectros., 1938, 51—53).—Simple apparatus suitable for analysis of medicinal products is described, and typical uses are mentioned. A. J. M.

Application of spectrographic methods to the determination of total body-water with sulphanilamide. E. E. PAINTER (Proc. Sixth Conf. Spectros., 1938, 125—127).—The concn. of injected sulphanilamide in body-water is the same for all tissues on the basis of water content. The concn. of sulphanilamide was determined by diazotising and coupling with dimethyl-α-naphthylamine followed by spectrographic analysis. The intensity of colour developed is proportional to concn. of sulphanilamide. It should be possible to determine total body-water by measuring the extent to which a known amount of sulphanilamide is diluted in the body-fluids. In the case of man this involves analysis of sulphanilamide and acetylsulphanilamide as the former is rapidly conjugated with acetic acid after injection. Only by spectrographic methods is it possible to determine conveniently the combined amount of these substances at any one time. A. J. M.

Determination of lactic acid in biological material by oxidation with ceric sulphate. J. J. GORDON and J. H. QUASTEL (Biochem. J., 1939, **33**, 1332—1337; cf. Fromageot and Desnuelle, A., 1935, 1223).—At 50°, lactic acid (*e.g.*, in 5 ml. of untreated c.s.f. or of blood treated with oxalate and deproteinised with trichloroacetic acid) is determined in a Schrödter flask in N_2 by adding excess of $Ce(SO_4)_2$ in N-H_2SO_4, trapping the acetaldehyde produced in aq. $NaHSO_3$, and applying the procedure of Friedemann *et al.* (A., 1927, 800). Substances commonly present in biological material (*e.g.*, glucose, fructose, pyruvic acid, starch, urea) do not interfere unless present in abnormally high concn. The error does not exceed ±5%. $Fe(CN)_6'''$ if present must be removed by acidifying with trichloroacetic acid and adding just sufficient $Fe(NH_4)_2(SO_4)_2$ to react with the $Fe(CN)_6'''$ together with a drop of aq. $FeCl_3$. W. McC.

Deproteinisation in Folin and Wu's method. A. SCHOGER (Klin. Woch., 1939, **18**, 997—998).—Filtration of the ppt. was sufficient instead of centrifuging. E. M. J.

Micro-determination of reducing sugars in body-fluids (blood, spinal fluid). M. LE BERRE (Bull. Sci. pharmacol., 1936, **43**, 507—511; Chem. Zentr., 1937, i, 1744—1745).—The method of Fontès and Thivolle gives inaccurate results owing to oxidation of the Cu_2O. This is avoided by co-pptn. of $Al(OH)_3$; the centrifuged ppts. are treated with a phosphomolybdic acid solution, and titrated with $KMnO_4$ until colourless. A. J. E. W.

Animal lipins. XIV. Determination of lecithin, kephalin, and sphingomyelin in body-fluids and tissues. Analyses of normal human sera. S. J. THANNHAUSER, J. BENOTTI, and H. REINSTEIN. **XV. Lecithin, kephalin, and sphingomyelin content of normal human organs.** S. J. THANNHAUSER, J. BENOTTI, A. WALCOTT, and H. REINSTEIN (J. Biol. Chem., 1939, **129**, 709—716, 717—719; cf. A., 1938, III, 739).—XIV. A $CHCl_3$–methanol extract of the material is evaporated to dryness and the residue extracted with $CHCl_3$ to separate preformed choline, the extract being again evaporated. The phosphatides are decomposed by boiling HCl–methanol and the liberated choline is determined colorimetrically as the reineckate. The lecithin + sphingomyelin can thus be calc., and subtraction from the total phosphatide gives the kephalin content. Vals. for lecithin and sphingomyelin can be determined by Thannhauser's method. Normal vals. for sera of fasting individuals are sphingomyelin 15—35, kephalin 50—130, and lecithin 50—200 mg. per 100 c.c.

XV. Vals. are given for normal brain, lung, spleen, kidney, liver, and heart. P. G. M.

Manometric determination of glutathione in tissue extracts. A. H. ENNOR (Austral. J. Exp. Biol., 1939, **17**, 157—172).—The manometric determination of glutathione (by its activation of glyoxalase) in rat and mouse liver extracts is described; it does not necessitate use of standard glyoxalase prep. The liver-glyoxalase activity varied greatly amongst normal rats. D. M. N.

Determination of small amounts of chlorophyll. E. S. JOHNSTON and R. L. WEINTRAUB (Smithsonian Misc. Coll., 1939, **98**, 1—5).—Suitable apparatus is described. The method is based on the transmission of light in the region of the red absorption band of a solution of chlorophyll in acetone. The transmitted energy is determined by means of a galvanometer and an extremely sensitive vac. thermocouple. Vals. are compared with a calibration curve obtained by using known amounts of chlorophyll. About 5—10 min. are required for each observation, and, with a 5-cm. cell, 0·1 μg. of chlorophyll can be determined. Carotenoid pigments do not interfere, and minor fluctuations in light intensity do not affect

the determination. Errors due to subjective intensity and colour comparisons are avoided. J. N. A.

Effect of urea and sodium chloride on the colorimetric determination of organic phosphate by King's method. J. J. RAE and E. V. EASTCOTT (J. Biol. Chem., 1939, **129**, 255—262).—Urea or NaCl (above 0·5M.) invalidates King's method (A., 1932, 786) of determining org. phosphate. Modifications are described to overcome the difficulties. R. S. C.

Determination of sulphur in biological material. M. MASTERS (Biochem. J., 1939, **33**, 1313—1324).—The Na_2O_2 fusion and the Benedict–Denis methods are unsuitable but the HNO_3–$HClO_4$ method is reliable and can be used for large samples. It is unnecessary to remove Fe before pptg. $BaSO_4$. A modified hydrogenation method is more rapid and sensitive than the oxidation methods. E. M. W.

Micro-determination of calcium in serum. A. E. SOBEL and B. A. SOBEL (J. Biol. Chem., 1939, **129**, 721—728).—A modification is described of an earlier method (A., 1938, I, 212) involving the use of a specially designed centrifuge tube, by which determinations can be made on 0·1 c.c. of serum instead of 2·0 c.c., the average agreement between the two methods being ±1·1%. P. G. M.

Determination of lead in biological materials. S. L. TOMPSETT (Biochem., J., 1939, **33**, 1231—1326)—Improvements in the method of Tompsett and Anderson (A., 1935, 1160) are described particularly with regard to the ashing and to materials containing a high proportion of $Ca_3(PO_4)_2$. H. G. R.

Determination of bismuth in biological material. Photometric dithizone method. D. M. HUBBARD (Ind. Eng. Chem. [Anal.], 1939, **11**, 343—354).—A photometric "mixed colour" dithizone method for the determination of Bi in biological material is described. After ashing, the Bi is pptd. as sulphide in presence of added Cu, and then extracted with Cu and Pb from the solution of sulphides in dil. HNO_3 by means of dithizone in $CHCl_3$. Cu is eliminated by extraction of the Bi and Pb in presence of KCN at controlled p_H, whilst Pb is excluded by extraction of the Bi by $CHCl_3$+ dithizone at p_H 2. The method permits the accurate determination of less than 5 μg. of Bi and 95% recoveries have been obtained with quantities of Bi above 50 μg. L. S. T.

(xxix) NEW BOOKS.

Human gastric secretion. BENGT J. E. IHRE (Oxford University Press, 1939, 232 pp. Price 12*s*. 6*d*.).—This book, which was first published in November, 1938, as a supplement to the Acta Medica Scandinavica, is based on a long series of experiments carried out at St. Erik's Hospital, Stockholm, with a view of obtaining data regarding gastric secretion in normal and pathological conditions. In a short opening chapter, Dr. Ihre discusses briefly the three known phases of gastric secretion, psychic, chemical, and intestinal. Methods and technique are next described; the Lagerlöf–Ågren double tube was used, together with continuous gastric aspiration by means of water suction, thus preventing regurgitation of duodenal juice and loss of gastric juice through the pylorus and ensuring accurate quant. results. Admixture of saliva was avoided by the use of continuous aspiration from the mouth. Fasting specimens were obtained in every case, followed by injections of histamine and insulin as stimulants of gastric secretion. All p_H determinations were made electrometrically; it is claimed that the results are more accurate than those obtained colorimetrically. The possible factors in the regulation of intragastric acidity are discussed and, apart from duodenal regurgitation and secretion of alkali and mucus, much importance is made of Teorell's diffusion theory; this emphasis may be unjustified, since there is no general acceptance of the three processes postulated by this worker *i.e.*, HCl secretion, back diffusion of HCl mols., and diffusion of NaCl mols. into the stomach. The remainder of the book is a record of gastric secretion in normal and pathological states, rendered more valuable by the full case records, with clinical, radiological, and gastroscopic findings, in addition to the excellent gastric secretory curves. This book should be read by all those interested in the study of gastric function in health and disease. A. M. G.

Tropanol et pseudotropanol. Actions physiologiques comparées. [Comparative physiological effects of tropine and pseudotropine.] R. HAZARD (Masson & Cie., Paris, 1939, 87 pp.).—Tropine and ψ-tropine are optically inactive stereoisomerides which differ widely in their physiological effects. Tropine reduces the blood pressure and depresses the heart, ψ-tropine has the opposite effects. Tropine depresses the action of the parasympathetic, ψ-tropine does so after a transitory stimulating effect. Tropine has a curare effect on muscle, ψ-tropine lowers the chronaxie of the muscle before it raises it. During these primary stimulating effects ψ-tropine antagonises tropine. Tropanone, in which the isomerism does not exist, approaches ψ-tropine in its effects, particularly in its nicotine-like action. Oximation of the ketone group in tropanone with NH_2OH destroys its activity but the semicarbazone is more active than the parent substance. Oxygenation of the amine group in tropine and ψ-tropine destroys their action on the vagus and cardiovascular system. Demethylation of this group in tropine diminishes its action on the heart and blood pressure but in ψ-tropine these actions are augmented. These findings show that geometrical (*cis–trans*) isomerism may produce qual. differences in physiological action whereas in optical isomerism only quant. differences have so far been described. The evidence is well presented and many tracings are reproduced. P. C. W.

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