BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

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

JULY, 1939.

(i) GENERAL ANATOMY AND MORPHOLOGY.

Muscle of diaphragm. F. Körner (Z. ges. Anat., I., Z. Anat. Entw. Gesch., 1938, **109**, 282—292).—The central tendon develops as an enlargement of the primitive, central, connective tissue part in the embryo. W. B.

Morphology and morphogenesis of intercostal muscles and ligaments. L. Bucciante (Arch. ital. Anat. Embriol., 1939, **41**, 475—526).—In mammalian (including human) embryos there is a mesenchymal layer between the two intercostal muscles which gives rise to the anterior intercostal ligament; the posterior ligament arises from the endothoracic fascia. The internal intercostal muscle is a single anatomical entity. S. O.

Muscles of upper urinary passages. W. Schneider (Z. ges. Anat., I., Z. Anat. Entw. Gesch., 1938, **109**, 187—196).—The muscle fibres are arranged in spirals, starting above, and laterally they run clockwise and anti-clockwise downwards and medially. W. B.

Function and innervation of muscles of soft palate. W. Moritz (Z. ges. Anat., I., Z. Anat. Entw. Gesch., 1938, **109**, 197—206).—Certain nervous diseases demonstrate that the M. levator veli palatini is supplied by the facial nerve, the M. tensor palatini partly by the glossopharyngeal nerve. W. B.

Pharynx of the new-born. O. Schneider (Z. Ges. Anat., I., Z. Anat. Entw. Gesch., 1938, **109**, 230—244).—The new-born child has a short pharynx and a long velum palatinum. The borders of the velum and epiglottis touch. The laryngeal aditus is behind and beneath the choanae. W. B.

Structure of human iris. E. Freerksen (Z. ges. Anat., I., Z. Anat. Entw. Gesch., 1938, **109**, 207—229).—The superficial structure of the iris is described. Resemblances in structure in twins and relatives are considered. The structure may be similar in individuals of differing ancestry. W. B.

Centres of ossification from birth to 5 years. C. C. Francis and P. P. Werle (Amer. J. phys. Anthrop., 1939, **24**, 273—299).—A schedule for the date and sequence in appearance of centres of ossification for both sexes is presented. Variation in the date of commencement of ossification and in its progressive development is the result of metabolic disturbance. Primary centres are more apt to be delayed than centres appearing in epiphyses. Irregularities of ossification (osteochondrosis) may occur in the absence of clinical evidence of disturbance. Primary centres are more prone to irregularities and the patella in boys is the most frequent site for its occurrence. W. F. H.

Fœtal age assessment by centres of ossification. A. H. Hill (Amer. J. phys. Anthrop., 1939, **24**, 251—272).—The semicircular canals are evident by the end of the 3rd month. The vertebral column undergoes rapid ossification during the early months; one or two segments may be added after the 5th month. The centres for the phalanges of the hand are complete in no. at the 3rd month. The phalanges of the foot ossify more erratically but are usually complete in no. at term. The calcaneum is visible at the 5th month, the talus a month later, and the cuboid at birth. Sexual differences in the time of appearance of centres up to the 6th month are not appreciable. Mineralisation occurs ½—1 month later in the male than in the female. Records were obtained radiographically and from the data recorded a time-table for the appearance of centres in consecutive months of fœtal life was constructed using mainly the crown–rump basis of classification. W. F. H.

Radiography of the petrous bone. C. Chaussé (Proc. Roy. Soc. Med., 1938, **32**, 119—126).—A new method of radiographic examination, designated "anti-diffusion stereoradiographic analyses," in which the quality of the radiogram is greatly improved by a precise localisation process, is described. The method is particularly suitable in the radio diagnosis of fractures of the labyrinth, mastoiditis, foreign bodies, etc. and with less precision for the exploration of cavities. A combined method for the localisation and extraction of radio-opaque objects by means of the "light compasses" consists in the use of light beams guiding the surgeon and so combining the operations of localisation and extraction. W. F. H.

Radiology of the mastoid process. H. G. Hodgson (Proc. Roy. Soc. Med., 1938, **32**, 126—130).—The surgical importance of the anatomical types of the mastoid and the distribution of the cells is emphasised. Three separate views are taken: (1) the postero-anterior oblique, showing the process clear of overlapping shadows, indicates whether it is cellular or not, the thickness of its cortex, and the extent to which cells spread into the petrous bone; (2) the lateral oblique view to demonstrate the relationship of cells to the knee of the lateral sinus, squama, and zygoma; (3) the 30° fronto-occipital axial or end-on view of both processes on the same film. W. F. H.

Femoral neck in childhood. R. Ollerenshaw (Proc. Roy. Soc. Med., 1938, **32**, 113—118).—A review of 16 cases of infantile coxa vara. Radiographically a clear area in the neck, distal to the

epiphysial line, containing a V-shaped fragment of bone in its lower part is noteworthy. In some a translucency of the femoral head and " shelving " of the upper part of the acetabulum were noted. The pathological changes are those of " aseptic necrosis." 22 cases of " slipped epiphyses " are also considered. The condition is due to disease mainly concerned with endocrine inbalance. W. F. H.

Erectile tissue of the penis and mechanism of erection. L. J. Deysach (Amer. J. Anat., 1939, **64**, 111—131).—Arterial injection causes complete erection in those mammals which possess a long os penis but it is often ineffective in producing erection in mammals which do not possess a long os penis. In the latter group the deep veins of the penis are modified to form a sluice-valve arrangement; a system of large and small " sluice channels " connects the venous spaces of the corpora cavernosa with the deep veins; the latter have thick muscular walls which compress the small thin-walled channels and so cause the blood to be dammed back in the erectile tissue. The corpus spongiosum plays only a passive rôle during erection; its main drainage is by the deep dorsal vein, which, unlike the venæ profundæ, possesses numerous valves. H. L. H. G.

Comparative anatomy of mammalian penis. E. J. Slijper (Acta neerland. Morph., 1938, **1**, 375—418).—The finer anatomy of the penis is described in various mammalian groups. The connective tissue of the intrapreputial part of the penis is primitively undifferentiated; it may become vascularised, and may split into a subcutaneous and a periurethral layer. The primitive penis is of the short, pendulous type. All modifications in structure occur both onto- and phylo-genetically in a proximo-distal direction. 4 types of penis are found in placental mammals: indifferent, fibro-elastic, vascular, and intermediate; the mode of copulation varies according to the type. (B.) H. L. H. G.

Morphology of penis bone. S. Tobinaga (Keijo J. Med., 1938, **9**, 244—272).—The penis bone was found to be present in a const. position in carnivora, in simplicidentata among the rodentia, in chiroptera, and in primates. It was not found in man (50 penes of Koreans examined). The cases in which it had previously been described in man were probably pathological. Shape, size, and structure are described. F. Ja.

Clitoris bone. S. Simokawa (Keijo J. Med., 1938, **9**, 273—282).—Orders and families of animals are given in which a clitoris bone is present and in which it is absent. There is no parallelism between the presence of a clitoris and a penis bone. Position, shape, size, and structure are described. F. Ja.

Organ work and organ weight. F. Walter and T. Addis (J. Exp. Med., 1939, **69**, 467—483).—The relationships of organ wt. to body wt. were investigated in 1591 albino rats. The relative heart wt. is unaffected by diet but the kidney and liver wts. vary with the protein intake, but all three vary with alteration in metabolic rate. In general, variation in organ wt. is dependent on the amount of work done by that organ. A. C. F.

Osteogenesis in the carotids. R. Argaud and J. de Boissezon (Bull. Histol. Tech. micr., 1939, **16**, 65—73).—In the equidæ the carotid sinus is dilated into an elastic pouch between the 2 large muscular arteries, and contains in the wall an ovoid " intercarotid bone "; sometimes bony nodules are found all around the internal carotid. The bone develops in cartilage, traces of which usually persist; ossification begins at birth. The process is not analogous with senile calcification of blood-vessel walls. E. E. H.

Case of left superior vena cava without a corresponding vessel on the right side. W. J. Atwell and P. Zoltowski (Anat. Rec., 1938, **70**, 525—532). H. L. H. G.

Anomalies of venæ cavæ superiores in an orang. R. E. Chase and C. F. de Garis (Amer. J. phys. Anthrop., 1938, **24**, 61—65).—A left superior vena cava persisting as a tributary of the left extremity of the coronary sinus is described. The right superior vena cava, a short distance above the right atrium, received a large tributary made up of veins from the upper part of the right lung. Veins from the lower part of the right lung united to form a trunk opening into the left atrium. There was no other cardiac abnormality. W. F. H.

Abnormality of inferior vena cava. J. H. M. G. van Deth (Acta neerland. Morph., 1937, **1**, 58—63).—The venous anomalies (absence of supra-renal segment of inferior vena cava and variation of spermatic veins) are explained ontogenetically by the absence of a right subcardinal vein. H. L. H. G.

(ii) DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Time of atrophy of the embryonic nuclear layer of cerebellum in Japanese. Wada-Setu (Fukuoka Acta Med., 1939, **32**, 20—20). W. D'S. M.

Development of duodenum. G. Töndury (Z. ges. Anat., I., Z. Anat. Entw. Gesch., 1938, **109**, 252—277).—The position of the duodenum is the result of a rotation of the duodeno-jejunal flexure around the vascular pancreatic stalk. W. B.

Mammalian thymus IV. Development in the dog. M. C. Godwin (Amer. J. Anat., 1939, **64**, 165—201).—Representative stages from 4-mm. embryos to adult dogs were examined. Thymus IV is late and irregular in appearance; it is not found until 2 weeks before birth; it is present on one or both sides in just over half the animals; it may lie outside or be included within the thyroid. It probably arises from pouch IV in the same way that thymus III arises from pouch III; there is no indication that it can arise by transformation of thyroid, parathyroid, or ultimobranchial material. The ultimobranchial body has no intrinsic thyroid-forming potency, but it forms thyroid tissue by induction if it is sufficiently closely related to the thyroid parenchyma; otherwise it remains as epithelial remnants. (29 figs.) H. L. H. G.

Neuro-hepatic complex in cow embryo. A. Grenade (Compt. rend. Soc. Biol., 1939, **130**, 271—273).—At the 4-cm. stage hepatic cells detach them-

selves from the hepatic canal epithelium, cystic canal, and the neck of the gall bladder. This process continues up to the 20-cm. stage. These cells form intimate contact with nerve elements and these complexes are still present at the 74-cm. stage. The hepatic cells may remain unaltered but mostly undergo nuclear and cytoplasmic changes. P. C. W.

Rôle of ectodermal placodes in goose embryo. E. VAN CAMPENHOUT (Compt. rend. Soc. Biol., 1939, **130**, 270—271).—The cranial placodes form an essential constituent in the development of the cranial nuclei of the goose. P. C. W.

Homoioplastic skin transplantation. S. SUZUKI (Fukuoki Acta med., 1939, **32**, 1—6). W. D'A. M.

Congenital diseases. J. B. S. HALDANE (Lancet, 1938, **235**, 1449—1455).—A review. C. A. K.

Hereditary brachydactylia and allied abnormalities in the rabbit. H. S. N. GREENE and J. A. SAXTON, jun. (J. Exp. Med., 1939, **69**, 301—314).—Hereditary brachydactylia and acheiropodia in rabbits is dependent on simple recessive factors; vascular dilatation in the limb buds followed by hæmorrhage and necrosis result in deformity by the 25th day of fœtal life. A. C. F.

Catalase activity during development of the chick embryo. A. KLEINZELLER and H. WERNER (Biochem. J., 1939, **33**, 291—292).—The catalase content of the embryo was determined from the 4th to the 15th day, during which period it rises, whilst the anaërobic glycolysis falls. The logarithmic curve is a straight line. P. G. M.

Effect of sulphuric esters [heparin] on growth of tadpoles. H. HOLMGREN (Z. ges. Anat., I., Z. Anat. Entw. Gesch., 1938, **109**, 293—299).—Heparin, 1 : 10,000, stimulates the growth of tadpoles; chondroitinsulphuric acid has no stimulating effect. W. B.

Action of colchicine on cellular development. C. M. LAUR (Ann. Anat. path. méd.-chir., 1938, **15**, 792—799).—The action of colchicine on the growth of certain plants and the metamorphosis of the frog is described. The meristematic region of root tips in bulbs is retarded in growth; the plant is stunted but may flower. A 1 : 50,000 concn. accelerates development of the frog egg. The effects of toxic doses on karyokinesis and tissues generally are described. Yeast cells are not acted on. W. F. H.

Experimentally induced strophosomy in chickens. P. ANCEL and S. LALLEMAND (Compt. rend. Soc. Biol., 1939, **130**, 385—387).—The development of this monstrosity (schizostoma reflexum) in chicks following the injection of 0·025 mg. of colchicine into the egg after 48 hr. incubation is described. 26% of the injected eggs produce monsters, 42% die within 24 hr. of the injection, and the rest are normal. The monstrosity is fully developed at the 10th day of incubation. The first sign of the condition is the absence of the caudal curvature which normally develops at the 65th hr. of incubation. P. C. W.

Production of fowl strophosomes by means of colchicine. S. LALLEMAND (Compt. rend., 1938, **207**, 1446—1447).—Colchicine (0·0025 mg.) applied to a 48-hr. chick embryo may kill it, be without action, or produce a malformed embryo (3—13 days) in which the thoracic and abdominal viscera are exposed, and the limbs and tail are strongly retracted dorsally. J. L. D.

Coupling and exchange of gene factors in man. O. KOEHLER (Dtsch. med. Wschr., 1938, **64**, 1841—1843, 1874—1876).—A review. A. S.

Changes in density of the *Rana pipiens* embryo during development. R. W. BRIGGS (J. Cell. Comp. Physiol., 1939, **13**, 77—89).—Between fertilisation and the early neurula stage the egg decreases in density at a rate which is greater than rate of development at temp. up to 18° and less than rate of development above 18°. From the early neurula stage the embryo increases in density up to the late neurula stage and then decreases until hatching. These rates are independent of temp. V. J. W.

Artificial incubation of game birds. III. Effect of air movement on incubation. IV. Interrelation of temperature, humidity, and air movement. A. L. ROMANOFF (Cornell Univ. Agric. Exp. Sta. Bull., 1938, No. 687, 1—14, 15—30).—III. Pheasant and, more especially, quail eggs are sensitive to high rates of movement of air in the latter part of the incubation and to difference in temp. between the top and bottom of the egg during the early stages.

IV. A species-sp. relationship is established between temp., R.H., and movement of air in the incubator for optimum hatching. A. G. P.

(iii) PHYSICAL ANTHROPOLOGY.

Brain convolutions of the *Pithecanthropus erectus* of von Koenigswald. K. H. BOUMAN (Acta neerland. Morph., 1938, **2**, 1—3).—The convolutionary pattern of the frontal lobes of von Koenigswald's specimen of *Pithecanthropus* resembles that of Dubois' specimen so closely that the individuals must have belonged to the same species. H. L. H. G.

Blood group determinations on bones of thirty Aleutian mummies. P. B. CANDELLA (Amer. J. phys. Anthrop., 1939, **24**, 361—386).—The results are unlike any blood group findings yet recorded in North American Indians in that group *B* was found. An attempt to correlate the blood group results with the cranial indices of 20 adult crania showed that the index of group *B* crania is slightly higher than the average for group *A* and that the average index of females in group *B* is slightly higher than that of males. The relevant literature of the blood groups of the native tribes of North East Siberia and North America is reviewed. W. F. H.

Ideal body type for an aviator. W. B. WILSON (J. Aviation Med., 1938, **9**, 155—160).—An analysis of several groups of pilots and of cadet applicants fails to reveal any correlations between Kretschmer types and fitness for, or success in, aviation. W. F. F.

(iv) CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Liver of the pig : hepatic lobule and liver cell during post-natal growth. E. G. White (J. Anat., Lond., 1939, **73**, 365—386).—The separation of lobules by collagenous septa occurs after birth within 60 days; there is no increase in the no. of lobules later than 7 days after birth. The mean diameter and vol. of the lobules were determined. Mitoses are most numerous between 1 and 7 days post-natal; binuclear cells varied from 1·34% in the new-born to 11% in the adult. E. E. H.

Periodic and rhythmic mitotic activity in the kidney of the albino rat. C. M. Blumenfeld (Anat. Rec., 1938, **72**, 435—443).—96 rats, 28 days old, were killed at 2-hr. intervals over a 24-hr. period and the renal cortex was examined for mitoses. Mitotic activity was greatest at 3 p.m. and least at 11 p.m.; a 6-hr. cycle was also apparent. H. L. H. G.

Solubility studies of secretion granules of the guinea-pig pancreas. S. H. Bensley (Anat. Rec., 1938, **72**, 131—136).—In the guinea-pig pancreas, alpha granules are readily sol. in water or normal salt solution; in order to study experimental changes in the alpha cells it is therefore necessary to fix the tissue immediately. Beta and zymogen granules are insol. in water and normal saline, but are sol. in dil. NaOH and in alcohol; Mankowski granules resist all these solvents. H. L. H. G.

Periodic variations in the size of the nuclei of pancreatic cells. P. Nicolaj (Boll. Soc. ital. Biol. sperim., 1939, **14**, 23—25).—Comparative data for the nuclei of cells of pancreas and liver (rat) are given and discussed. F. O. H.

Morphology of human spermatozoa. O. J. Pollák and C. Joël (Arch. exp. Zellforsch., 1938, **22**, 77—89).—A detailed description of the cellular content of normal and abnormal human semen. In certain diseases clear-cut cell pictures may be obtained. R. J. O'C.

Innervation of chromatophores. J. Tusques (Compt. rend. Soc. Biol., 1939, **130**, 56—58).—Nerve fibres terminating in the melanophore cells in the tadpole tail can be demonstrated by staining by a modified Bielchowski-Gros method. P. C. W.

Histophysiology of the chondrioma in striped muscle. P. Rojas and L. S. Resta (Rev. Soc. argent. Biol., 1938, **14**, 476—479).—The sartorius of *Bufo arenarum* was vitally stained and observed *in vivo* and then fixed and sections were obtained. The chondrioma is situated between the fibrils; it accumulates around the nuclei. Stimulation of the muscle makes the chondrioma disappear; the whole fibre takes on a diffuse blue-green tint. It did not reappear after stimulation during the time observed. Experiments were performed in winter. J. T. L.

Structure of the media of distributing arteries by the method of micro-dissection. K. C. Strong (Anat. Rec., 1938, **72**, 151—167).—Examination of the distributing arteries of several animals, including man, shows that the media is always formed of sheets of obliquely arranged fusiform muscle fibres which are so closely united as to suggest a syncytium; these sheets form a continuous spiral structure; no fascicular arrangement is present. The folding of the internal elastic lamina is intrinsic in the membrane and is not due to post-mortem contraction of the muscle of the media. The functional significance of the spiral structure is discussed. (2 plates.) H. L. H. G.

Studies on *Chironomus* chromosomes with the polarising microscope. H. H. Pfeiffer (Nature, 1939, **143**, 335).—Chromosomes of the salivary glands of *Chironomus* show double refraction of the transverse bands when pressed out into paraffin, particularly when stretched. Wrinch's model of a chromosome as a net of polypeptide mols. offers possibilities of explaining the contractile and swelling properties of chromosomes. L. S. T.

Analysis of growth and cell-division in tissue cultures. K. A. Petrovskaja (Trans. Conf. Med. Biol., 1937, 177—181, 288).—Removal of the initial graft of chick embryo fibroblasts does not necessarily inhibit growth in the peripheral zone. R. T.

Effect of lead, acting at a distance, on tissue cultures. D. Ruffilli (Boll. Soc. ital. Biol. sperim., 1938, **13**, 1050—1052).—The inhibitory, distance-effect of Pb on the growth of chick embryo tissues *in vitro* is described. The effect, which is inhibited by insertion of a thin layer of material (*e.g.*, paraffin) between Pb and tissue, is dependent on the surface area of the Pb and the distance between Pb and tissue. F. O. H.

Artificial maintenance media for cell and organ cultivation. L. E. Baker and A. H. Ebeling (J. Exp. Med., 1939, **69**, 365—378).—Details are given for the prep. of suitable media for maintenance of tissue cultures. A. C. F.

Electrical potential of cells. R. Keller and E. Singer (Amer. J. Surg., 1939, **43**, 169—187).—Electrical charges in cells in various states of metabolism are reviewed. A method of determining the nature of electrical charges in cells by vital staining is described. P. C. K.

Capillary luminescence and the nature of histological dyes. G. Kiszely and B. Bugyi (Magyar Orv. Arch., 1938, **39**, 480—494).—The diffusion of dyes in distilled water, acid, base, alcohol, and Ringer's solution is reported. The p_H and electrolyte content of the medium have a marked influence on the dye diffusion, acid dyes diffusing more readily in basic and basic dyes more readily in acidic solutions. A. W. M.

Use of Janssen's iron hæmatoxylin in place of the Weigert acid iron chloride hæmatoxylin. R. D. Lillie and W. R. Earle (Stain Tech., 1939, **14**, 53—54).—Weigert's staining mixture is good for not more than 7 days; Janssen's mixture remained satisfactory for 5 weeks. A solution of 2 g. of hæmatoxylin in 60 c.c. of abs. methyl alcohol is added to 200 c.c. of distilled water containing 20 g. of Fe alum crystals, and 60 c.c. of glycerin are added. E. E. H.

Dehydration of methylene-blue-stained material without loss of dye. N. D. Levine (Stain Tech., 1939, **14**, 29—30).—The tissue after staining is

washed in distilled water, put into warmed *tert.*-butyl alcohol for 2 min., then in 3 changes of the same for an hr. each, and mounted directly in balsam. E. E. H.

Use of the Feulgen technique with certain plant materials. T. W. Whitaker (Stain Tech., 1939, **14**, 13—16).—The Feulgen technique as modified by Heitz can be applied to root tip smears and smears of plant microspores. The material is mounted finally from 95% alcohol in euparal. Details of chromosome fragmentation are well shown. E. E. H.

Differential staining of nucleoli and chromosomes. C. S. Semmens and P. N. Bhaduri (Stain Tech., 1939, **14**, 1—5).—Material is fixed in Navashin's or Levitsky's solutions, and the chromatin stained by Tomasi's modification of the Feulgen technique. After mordanting in 5% Na_2CO_3, the nucleoli are stained in aniline-light-green. Chromatin is stained magenta and nucleoli green. E. E. H.

Azocarmine stain for bone marrow. M. B. Ralston and A. H. Wells (Amer. J. clin. Path., Tech. Suppl., 1939, **3**, 72—73). C. J. C. B.

Modified stain for trematodes. W. C. Gower (Stain Tech., 1939, **14**, 31—32).—Details are given of the prep. and usage of a modified carmine stain. As it is purely nuclear, there is no diffuse staining of cytoplasm, and the organs stand out in the transparent body. E. E. H.

Azureosin glycerin drop stain for mycosis and other skin lesions. E. Hoffmann (Klin. Woch., 1939, **18**, 283—284; cf. A., 1939, III, 1). E. M. J.

(v) BLOOD AND LYMPH.

Simple method for aspiration of bone marrow. M. Morrison and A. A. Samwick (J. Lab. clin. Med., 1939, **24**, 858—860). C. J. C. B.

Action of follicle hormone on bone marrow. W. Schrade (Folia haemat., Lpz., 1939, **61**, 145—154).—30,000—51,000 units of follicle hormone were repeatedly injected into dogs (up to 650,000 units). Marked leucocytosis with pre-mortal diminution in the no. of white cells, anæmia with inhibition of bone marrow erythropoiesis, and thrombopenia with hæmorrhagic diathesis developed. A. S.

Sternal puncture in Gaucher's disease. H. Schartum-Hansen (Folia haemat., Lpz., 1939, **61**, 180—185).—Typical "Gaucher" cells were found in bone marrow smears of 2 patients suffering from Gaucher's disease. The no. of macroblasts and of erythroblasts was increased. A. S.

Origin, development, and function of blood cells in marine teleosts. I. Morphology. E. S. Duthie (J. Anat., Lond., 1939, **73**, 396—412).—Circulating leucocytes of Labridæ and Triglidæ consist of fine neutrophil granulocytes, coarse chromophil granulocytes, lymphocytes, and thrombocytes: the fine neutrophil granulocyte is the homologue of the mammalian neutrophil. The primitive blood cell is a lymphoid hæmoblast. The coarse granulocytes are acidophil in Labridæ and basophil in Triglidæ except on epithelial surfaces where in both families the cells disintegrate and exert a protective action. The coarse granulocytes in tissues and in blood are identical. E. E. H.

Blood of warm-blooded animals in relation to constitution. W. Klein (Z. Zuchtung, **B**, 1938, **40**, 149—192).—In ruminants the normal lymphocytic blood picture is altered by an increase of polymorphonuclear leucocytes and large monocytes during pregnancy, labour, and lactation; the eosinophils diminish or disappear. New-born lambs have a blood picture similar to that of their mothers at birth, but after 3 months have the typical lymphocytic blood picture. The lymphatic blood picture is due to the alkalosis of ruminants, which changes to an acidosis during pregnancy producing a polymorphonuclear picture. The alkalosis also influences the animal's temperament. In ruminants large monocytes occur normally which in man would indicate a leukæmia. E. R.

How will sexual cycles of healthy women influence blood picture? Y. Kokubo (Tohoku J. exp. Med., 1939, **35**, 243—256). E. R.

Blood picture of "healthy" infants nursed with human milk of different Arakawa's reaction. S. Kuribayashi (Tokoku J. exp. Med., 1939, **35**, 191—242).—120 breast-fed infants 1—15 months old were investigated. The blood count of those fed with Arakawa-negative milk does not differ from those fed with Arakawa-positive milk, but shows wider fluctuations. E. R.

Blood picture of lactating women. Y. Kokubo (Tohoku J. exp. Med., 1939, **35**, 157—190).—277 healthy lactating women with Arakawa-positive and -negative milk were investigated. They show a leucocytosis, mainly owing to a lymphocytosis and an increase in eosinophils. E. R.

Disintegration of erythrocytes and denaturation of hæmoglobin by high pressure. R. B. Dow and J. E. Matthews, jun. (Phil. Mag., 1939, [vii], **27**, 637—639).—6 c.c. of sterile oxalated, bovine blood were introduced into a glass tube which was inverted in Hg in a steel cylinder and subjected to high pressures. After 3 hr. at 3500 atm. the following changes were noted: erythrocyte count fell from $7{\cdot}3 \times 10^6$ to 8×10^5 and leucocytes from 6700 to 800 per cu. mm.; both types of cell were distorted in a microscopic field; NaCl crystals (and possibly others) were visible; the O_2-binding capacity was decreased by 41%. After 6 hr. at 3500 atm. or $3\frac{1}{2}$ hr. at 13,000 atm. the blood was coagulated to a reddish-brown, rubbery mass, which on microscopic examination contained no erythrocytes, very few distorted leucocytes, no crystals, and a structureless jelly-like material. In another series of experiments (*a*) blood cells separated centrifugally from freshly drawn oxalated bovine blood were subjected to 5000 atm. for $\frac{1}{2}$—2 hr. and (*b*) approx. 50% aq. hæmoglobin to 5000 atm. for 2—4 hr. For (*a*) coagulation was complete and for (*b*) partly complete but similar to that of (*a*). When blood cells, suspended in Hayem's solution, are subjected to 5000 atm. for 1 hr. they disintegrate. The observed effects are

discussed and appear to be due partly to the mechanical effect of pressure and partly to chemical effects. W. R. A.

Action of short-lived inhalation of oxygen on hæmoglobin concentration and red cell count in man. II. A. J. Anthony (Z. ges. exp. Med., 1939, **105**, 417—422).—Inhalation of pure O_2 initially reduces red cell count and hæmoglobin concn. in resting man; after 15—20 min. O_2 inhalation, normal figures are attained again. A. S.

Diameter of human red cells during oxygen inhalation. A. J. Anthony and K. Bechthold (Z. ges. exp. Med., 1939, **105**, 423—429).—The diameter of red cells of normal resting subjects is reduced after inhalation of pure O_2 for 50 min.; this is attributed to the loss of Cl ions to the plasma owing to the associated acidæmia. The % of small and large red cells is increased. A. S.

Dietary treatment of polycythæmia. F. Herzog and G. Kleiner (Dtsch. med. Wschr., 1939, **65**, 719).—Normal red cell counts were obtained in 17 out of 19 patients suffering from polycythæmia by means of a diet grossly deficient in animal proteins (0·7 g. per day). A. S.

Hæmoblastic sarcoma (primitive red cell type) following polycythæmia vera. D. Perla and S. B. Biller (Arch. Path., 1939, **27**, 902—906).—(2 photomicrographs.) C. J. C. B.

Basophilic aggregations in blood of newly born animals and man. C. P. McCord and W. R. Bradley (Amer. J. clin. Path., 1939, **9**, 329—338).—New-born albino rats showed 71·7% and infants 5·3% of basophilic erythrocytes by this test. In infants the % returned to normal by the 8th day while in rats the basophilic substance % was high until the 100th day. C. J. C. B.

Case of non-tropical sprue with normoblasts and megaloblasts in peripheral blood. S. Frostad (Acta med. scand., 1939, **99**, 257—261).—A case occurring in Oslo is reported. C. A. A.

Familial elliptocytosis, a hereditary anomaly of red cells. S. J. Leitner (Dtsch. Arch. klin. Med., 1939, **183**, 607—646).—Various members of a family had elliptic red cells (90% of the total no.); there was no anæmia. The elliptocytosis persisted in blood cultures and serum of normal subjects. Normal red cells, suspended in serum of the patients, did not change their shape. CO_2 excess or O_2 deficiency had no influence on the elliptic cells. The fragility of the cells was normal. Erythroblasts and reticulocytes, obtained by bone marrow puncture, were of normal shape. A. S.

Determination of average diameter of erythrocyte. L. Schalm (Klin. Woch., 1939, **18**, 470—471). A small apparatus working on the diffraction principle is described. E. M. J.

Effect of ultra-violet light on the reticulocyte count. W. Grunke and H. Frommelt (Klin. Woch., 1939, **18**, 453—455).—The reticulocyte count rose in boys (aged 10—12) after several intensive irradiations with ultra-violet light; a max. was reached during the first 6 applications; the count then fell to normal vals. in spite of further applications (up to 10). E. M. J.

***X*-Ray damage and blood picture.** K. Marderstein (Strahlenther., 1939, **64**, 311—317).—A review. E. M. J.

Blood regeneration produced by a water-soluble liver factor in experimental plumbism. M. Lourau, G. S. de Sacy, and A. Arthus (Compt. rend. Soc. Biol., 1939, **130**, 642—644).—Blood regeneration took place equally in rabbits rendered anæmic by Pb poisoning and treated with liver fractions of varying degrees of purity all of which had hæmopoietic activity in pernicious anæmia. P. C. W.

Anæmic conditions in the new-born. H. Lehndorff (Mschr. Geburtsh. Gynäk., 1938, **108**, 264—276).—A lecture. S. Sch.

Effect of low-porphyrin diet on erythropoiesis and hæmoglobin regeneration. N. F. Kirkman (J. Physiol., 1939, **95**, 508—515).—If rabbits are fed on a low-porphyrin diet, the minority (36%) become anæmic after 3 months; when given chlorophyll they regenerated their hæmoglobin and red blood cells in 31 days; the majority (64%) do not become anæmic on this diet. After hæmorrhage, rabbits on the low-porphyrin diet recover their hæmoglobin and red cells in 14 days when chlorophyll is given and in 23 days without chlorophyll; rabbits on a stock diet recover in 13 days after similar hæmorrhage. Cats—bled to a similar degree—on a low-porphyrin diet take 32 days to recover with the aid of chlorophyll and 33 days without it. Rabbits utilise preformed pyrroles and also manufacture them. J. A. C.

Magnesium and potassium content of red cells in anæmia. V. Henriques and S. L. Ørskov (Skand. Arch. Physiol., 1939, **82**, 86—95).—The Mg content of red cells is occasionally, the K content considerably, increased in rabbits, and both are increased in dogs, after a severe hæmorrhage. Repeated subcutaneous injections of phenylhydrazine increase the red cell content in Mg of rabbits and dogs fivefold; the K content is increased up to 18-fold. Immature red cells are permeable to K and Mg. A. S.

Blood cell changes during experimental nutritional deficiency, anæmia, and recovery in the newt, *Triturus viridescens*, with special reference to the erythrocytes. H. E. Jordan (J. Morph., 1938, **63**, 143—161).—4 months' starvation caused the body-wt. to decrease to ½ the original and the blood vol. was much reduced. The spleen became very small and the subcapsular lymphogranulocytopoietic tissue was reduced to small patches of lymphocytes. The blood contains few erythrocytes which are degenerating. The nucleus becomes progressively larger with reduction of the cytoplasm; the naked nucleus finally breaks up. While the nucleus is enlarging it sends out filamentous processes into the cytoplasm or extrudes chromatic globules. These changes are attributed to the cytoplasm becoming hypotonic with resulting osmotic swelling of the nucleus and to weakening and fenestration of the nuclear membrane. The leucocytes are much reduced in nos. but are otherwise little changed.

The lymphocytes and esinophils almost disappear. The neutrophils and basophils become agranular. The thrombocytes are almost unchanged. 2 weeks' feeding on earthworms causes complete recovery from the experimental anæmia. A. D. H.

Nutritional anæmia of the rat. I. C. J. Hamre and C. O. Miller (Folia haemat., Lpz., 1939, **61**, 224—238).—Young rats were made anæmic by the method of Elvehjem and Kemmerer. On a normal diet, the anæmic rats recovered normal hæmoglobin and red cell count after splenectomy. Periods of increase in the no. of normoblasts and leucocytes occurred on the 2nd and 5th or 6th days of recovery of anæmic rats which had been given Fe and Cu. A greater increase in the no. of normoblasts and all types of leucocytes in splenectomised rats recovering from anæmia was found than in controls. A. S.

Chronic carbon monoxide poisoning and pernicious anæmia. H. Biedermann (Folia haemat., Lpz., 1939, **61**, 186—200).—A patient suffering from chronic CO intoxication with polyneuritis subsequently developed pernicious anæmia. A. S.

Active principle of liver in pernicious anæmia. R. Tschesche and H. J. Wolf (Naturwiss., 1939, **27**, 176; cf. Karrer *et al.*, A., 1938, III, 458).—A substance (C, 50·0, H 7·0, N 14·5, and S 0·6%; $[\alpha]_D = -75°$ in 50% acetic acid) highly active in pernicious anæmia was prepared from liver; 40 mg. can maintain the blood in a normal condition for at least one month. The Molisch and Millon's reactions are negative, the biuret reaction is very faint or negative, whilst the ninhydrin reaction is positive before and after hydrolysis. The substance is pptd. by Reinecke's and rhodanilic acids, and by $\frac{1}{2}$—$\frac{2}{3}$ saturation of the aq. solution with $(NH_4)_2SO_4$. Dialysis does not occur, or only very slowly, through parchment. Flavin, purines, pterins, reducing sugars, and PO_4''' esters are not present. J. N. A.

Effect of injecting carbon suspensions on leucocyte content of venous blood. A. Lumière, P. Meyer, and M. Szczecinski (Compt. rend. Soc. Biol., 1939, **130**, 663—665).—Injection of suspensions of animal charcoal into the ear vein of the rabbit produces changes in the leucocyte count of blood obtained from the opposite ear. There is a preliminary fall of 1500—7000 per cu. mm. which reaches a max. 30—90 min. after the injection, followed by a slow rise reaching a max. of 5000—20,000 per cu. mm. above the original val. 10 hr. after the injection. The count is normal after 24 hr. The change in the lymphocytes and monocytes is slower and not so pronounced as that in the polymorphs. P. C. W.

Causation of toxic alterations of neutrophils. R. Stodtmeister (Folia haemat., Lpz., 1939, **61**, 155—179).—Toxic alterations of the neutrophils were observed in various infectious diseases. Regeneration of the nuclei, diffuse or localised basophilism of the protoplasm (Döhle's granules), vacuolisation of the protoplasm with storage of fat droplets and glycogen are described. Bone marrow smears show that the maturation of the basophil granules in the cytoplasm of neutrophils is prevented and remnants of basophil substance are preserved. A. S.

Blood-sugar, blood pressure, and white blood cell count in allergic shock. G. L. Waldbott, M. S. Ascher, and S. Rosenzweig (J. Allergy, 1939, **10**, 220—227).—In 14 cases of allergic shock as a result of the injection of pollen extract, the average blood-sugar showed an immediate transient rise followed by a prolonged hypoglycæmia; the blood pressure showed a sharp fall which varied with the degree of shock and a leucopenia occurred. Controls are also described. C. J. C. B.

Short-time peroxidase reaction of blood polynuclears of rice-diseased (B_1-avitaminous) mice. T. Suzuki (Tohoku J. exp. Med., 1938, **34**, 417—433).—Prolongation of the peroxidase reaction time occurred earliest, and the life of the mice was shortest, in the group with abs. vitamin-B_1 lack combined with hepatic insufficiency (caused by daily injections of 3% NH_4Cl). In the mice with relative -B_1 deficiency the prolongation of the peroxidase reaction time occurred latest. Mere liver damage, caused as above, did not alter the peroxidase reaction time. F. Ja.

Wassermann reaction in infectious mononucleosis. W. Saphir (Amer. J. clin. Path., 1939, **9**, 306—310).—A case is described, with a strongly positive Wassermann and Kahn reaction and a maculopapular rash. C. J. C. B.

Infectious mononucleosis. E. A. Marshall (Amer. J. clin. Path., 1939, **9**, 298—305).—4 cases are described which simulated other diseases and were diagnosed by the Paul–Bunnell reaction. C. J. C. B.

Origin of monocytes. S. Thaddea and D. Bakalos (Dtsch. med. Wschr., 1939, **65**, 668—671).—A case of monocytic leukæmia is reported. The development of the monocytes is described on the basis of bone marrow smears and differential blood counts. The monocytes originate from azurophil granulated cells of the bone marrow belonging to mesenchymal elements. A. S.

Fatal agranulocytosis after sulphanilamide. H. E. S. Pearson (Brit. Med. J., 1939, I, 1031—1032).—A case is recorded; 34·5 g. of sulphanilamide were given in 23 days to a woman aged 60. C. A. K.

Nature of leukæmic blood cells as determined by their metabolism. W. Kempner (J. clin. Invest., 1939, **18**, 291—300).—The metabolism of the blood cells from 15 patients with lymphatic leukæmia and 40 patients with myelogenous leukæmia was determined by the Warburg method. Myeloblasts as well as lymphoblasts, in contrast to the more mature cells, have a purely oxidative metabolism and do not form lactic acid under aërobic conditions. C. J. C. B.

Relation of trauma to leukæmia. A. Yaguda and N. Rosenthal (Amer. J. clin. Path., 1939, **9**, 311—315).—A review, with 3 suggestive case reports. C. J. C. B.

Peracute myeloblastic leukæmia with symptoms of a transverse myelitis. H. Weil (Klin.

Woch., 1939, **18**, 547—548).—In a case of myeloblastic leukæmia ending fatally in 4 days, myeloblastic infiltration of the spinal cord at the level of Th 7—10 produced transverse myelitis. E. M. J.

Bony changes in leukæmia. K. Apitz (Virchow's Archiv, 1938, **302**, 301—322).—Leukæmic infiltration of the bone marrow may cause osteoporosis and local necroses of the bone. Lacunary osteoclastic bone absorption is only rarely found. H. W. K.

Specific gravity of blood in pneumonia. J. J. Elphinstone and E. M. Ward (Lancet, 1939, **236**, 1097—1099).—The sp. gr. of blood in 54 cases of acute lobar pneumonia varied directly with the severity of the disease. The mortality was high with sp. gr. over 1·062. C. A. K.

Red cell sedimentation rate in the normal guinea-pig. P. Nicholle and H. Simons (Sang, 1939, **13**, 401—415).—The errors in determining the sedimentation rate on heart-puncture blood are given and the superiority of carotid puncture is described. In 90 guinea-pigs, the rate in the first hr. was 1·06 mm. by the Westergren method, 1·84 in 2 hr., and 8·8 in 24 hr. C. J. C. B.

Normal values of red cell sedimentation rate with regard to age and sex. S. Akizuki and K. Hosi (Tohoku J. exp. Med., 1938, **34**, 465—469).—The sedimentation rate was determined in 14,916 healthy persons between the age of 8 and above 61 years. The curves obtained are different for both sexes. The lowest mean val. in males (3·3 mm.) occurred between 23 and 25 years, in females (9·2 mm.) between 14 and 15 years. The highest vals. were found above 61 years in both sexes. F. Ja.

Mol. wt., osmotic pressure, and physiological rôle of the plasma erythrocruorins (invertebrate hæmoglobin). J. Roche and M. S. Chouaïech (Compt. rend. Soc. Biol., 1939, **130**, 562—564).—The mol. wt. of the erythrocruorin of *Arenicola* is 370,000 at p_H 7·38 and 1,500,000 at p_H 5·80. The osmotic pressure has a max. val. at the isoelectric point. H. G. R.

Sedimentation rate in chronic illness. M. H. Stiles (Arch. intern. Med., 1939, **63**, 664—678).—Most of 292 patients with low-grade chronic infections, *e.g.*, sinusitis, showed an increased sedimentation rate, and an increase of the ratio of non-filamented to filamented neutrophils. C. A. K.

Hæmolysis and mobilisation of red cells after intravenous sodium chloride. J. D. Robertson and J. F. Barrett (Quart. J. Exp. Physiol., 1938, **28**, 405—411).—Injection of a 30% NaCl solution causes hæmolysis in cats and man. This hæmolysis also occurs *in vitro* and is therefore a direct action. The hæmolysis interferes with the determination of blood vol. by the vital-red method, but removal of hæmoglobin from the plasma by pptn. with alcohol in the cold permits accurate colorimetry. A further effect of the NaCl is a mobilisation of red cells and hæmoglobin. In eviscerated animals, with the liver excluded from the circulation, this effect is virtually abolished. T. S. G. J.

Method for determining erythrocyte fragility, using van Allen hæmatocrit tubes. G. M. Guest and M. Wing (J. Lab. clin. Med., 1939, **24**, 850—854).—The vols. attained by the cells in increasingly hypotonic solutions are expressed as a % of their initial vol. and recorded graphically. Hæmolysis is read in the same tubes. C. J. C. B.

Relationship between spherocytosis and sedimentation rate. F. Frimberger (Dtsch. med. Wschr., 1939, **65**, 788—792).—Red cells were suspended in a mixture of gum arabic and NaCl solution. The sedimentation rate was shorter with lower concns. of NaCl (starting with 2·92% NaCl solution). The shape of the red cells has no influence on sedimentation rate. Prolonged sedimentation rate in anæmia is attributed to a decrease of the plasma agglutination factor. A. S.

Clinical significance of the "Flockungszahlreaction." G. Seitz (Tohoku J. exp. Med., 1938, **33**, 230—246).—The significance of the "Flockungszahlreaction" is compared with that of the red cell sedimentation rate. It seems of special val. in judging therapeutic effects on circulatory decompensation and for the prognosis of lung tuberculosis. Numerous figures are given. F. Ja.

Determination of heparin in blood. W. Grunke (Klin. Woch., 1939, **18**, 443).—For the detection of minute concns. the toluidine-blue test should be performed in paraffined watch-glasses to prolong the coagulation time. E. M. J.

Factors in blood coagulation, in relation to hæmophilia. W. M. Bendien and S. van Creveld (Acta med. scand., 1939, **99**, 12—27).—Re-dissolution at p_H 7·0—7·5 of the ppt. obtained by dilution and acidification to p_H 5·7 of human or placental serum gave a "coagulation globulin," which on intravenous injection reduced the clotting time in hæmophilia. Oral and intramuscular administration was ineffective. Clear sterile solutions could be prepared from placenta, but were less potent *in vivo* than serum products, whereas the converse applied *in vitro*. No untoward effects resulted from their injection into hæmophiliacs or into rabbits; when applied locally to hæmorrhages in the former they were markedly hæmostatic. The factor was not ultrafilterable and was probably distinct from prothrombin. Its absence is the possible cause of hæmophilia. C. A. A.

Anti-coagulant action of rivanol. K. Liedholm (Acta med. scand., 1939, **99**, 53—60).—*In vitro*, coagulation of human blood was prevented for 1 hr. by 0·1 mg. per c.c. of the antiseptic rivanol, and 0·5 mg. sufficed for 12 hr. at 18°; at 37° the times were much shorter, 1·4 mg. per c.c. being necessary to maintain the blood fluid for 1 hr. When injected into rabbits the anti-coagulant action was small, even with the lethal dose of 100 mg. per kg. C. A. A.

Plasma-prothrombin levels in various vertebrates. E. D. Warner, K. M. Brinkhous, and H. P. Smith (Amer. J. Physiol., 1939, **125**, 296—300).—Using specially developed methods for stabilising fibrinogen and for preserving thromboplastin (kinase), the relative concns. of prothrombin in plasma were determined in a series of vertebrates with the follow-

ing results: dog 100, albino rat 95, cat 91, albino rabbit 89, man 84, guinea-pig 53, chicken 50, turtle 42, sea bass 31, sting ray 27, dogfish 8. M. W. G.

Nature of factor concerned in loss of blood coagulability of bile fistula and jaundiced rats. J. D. Greaves (Amer. J. Physiol., 1939, **125**, 423—428).—The effect of various dietary supplements on the bleeding tendencies of bile fistula and jaundiced rats was studied. The bleeding tendency develops after the blood-prothrombin level has fallen to 30% of normal or less; death following heart puncture occurs frequently in animals with prothrombin levels below 25%. The various preps. found active in bile fistula rats given stock diet were ox bile, boiled bile, cryst. bile salts, bile boiled with alkali, hexane extract of lucerne, vitamin-*K* concentrates given orally in great excess or in smaller quantities with bile salts; the latter given intraperitoneally or subcutaneously were also active. Bile fistula animals on -*K*-free diets gave similar results except that bile salts were inactive. Parenteral administration of -*K* concentrates corrects or controls the hæmorrhagic tendencies of jaundiced rats. Bile salts are essential for the intestinal absorption of -*K* in the rat. M. W. G.

Effect of inhibitory substances on time law of blood coagulation. T. Astrup and I. Astrup (Enzymologia, 1939, **6**, 64—71).—Application of the time law relationship (A., 1938, III, 870) of blood coagulation indicates that inhibitory substances form a complex of varying stability with thrombokinase. Heparin acts as an anti-thrombokinase, whilst thrombokinase directly activates the coagulation. F. O. H.

Problem in blood grouping. E. M. Katzin and P. Levine (Amer. J. clin. Path., 1939, **9**, 315—320). —Owing to the use of blood grouping of insufficient potency, a group *AB* was considered as a group *B*. C. J. C. B.

Blood sub-groups and their inheritance. L. Hirszfeld and Z. Kostuch (Schweiz. Z. allg. Path. Bakt., 1938, **1**, 407—420; cf. A., 1938, III, 975).—The content of *O*-group characteristic in groups A_1, A_2, and *B* varies, forming a falling series $A_2 > B > A_1$, so that A_1 and A_2 have no real delimitation but run into one another. The type containing less *O* is dominant over that with more *O*. Theories of inheritance of these characteristics are discussed. E. M. J.

Blood group specificity of thrombocytes. K. Schäfer and H. Grennerich (Klin. Woch., 1939, **18**, 491—492).—Addition of thrombocytes of group *A* or *B* reduces the agglutination titre of plasma *B* or *A* against red cells *A* or *B* to half; they therefore have some group-sp. properties. E. M. J.

Occurrence of anti-*O* (α_2) agglutinins. P. Dahr (Klin. Woch., 1939, **18**, 471—472).—Anti-*O* agglutinins were found in chicken, ox, dog, sheep, and pig but not in guinea-pig (140) or horse (85) sera. E. M. J.

Blood group tests. G. L. Taylor and E. W. Ikin (Brit. Med. J., 1939, I, 1027—1031).—The technique for diagnosis of the factors A_1, A_2, *B*, *O*, *M*, and *N* is described. Difficulties and sources of error are discussed. Tests on 1073 people in England gave results consistent with genetic theory. C. A. K.

Pathological anatomy of experimental thrombopenic purpura in the dog. L. M. Tocantins and H. L. Stewart (Amer. J. Path., 1939, **15**, 1—24). —Experimental thrombopenic purpura in the dog caused by injection of antiplatelet serum shows the following stages: acute stage (1st—5th day) exhibiting thrombopenia, prolonged bleeding time, hæmorrhages, œdema, and pigment deposits in the tissues; intermediate stage (5th—10th day) with a rising platelet count, short bleeding time, and multiple vascular thrombi in various organs especially the spleen; reactive stage (after 10th day) with high platelet count and hyperplastic changes in the bone marrow, spleen, lymph nodes, thymus, and Peyer's patches of the ileum. Intraperitoneal injection of antiplatelet serum in 2-day old pups was followed by almost complete disappearance of the usually numerous megacaryocytes from the liver, spleen, and bone marrow. (15 photomicrographs.) C. J. C. B.

Acute thrombopenic purpura [after sedormid]. A. Vogl (Wien. Arch. inn. Med., 1938/39, **32**, 273—282, 325—334).—4 patients suffered from acute thrombopenic purpura after administration of sedormid; the thrombocytes disappeared a few hr. after ingestion of a tablet, following a prolonged use of the drug without ill effects. Hæmorrhages persisted for 2—3 days; recovery then set in. A. S.

Examination of thrombocytes in dark field. E. Schaeffer (Folia haemat., Lpz., 1939, **61**, 239—244).—Various types of thrombocytes are described, as observed in extracted or heparinised blood of man, rabbit, guinea-pig, mouse, and frog by dark-ground illumination. A. S.

Thrombocyte count in old age. J. Arneth (Dtsch. Arch. klin. Med., 1939, **123**, 564—568).—The thrombocyte count in old age does not differ from that in young subjects. Many long thrombocytes with 2—5 granulomas with a tendency to agglutinate were found. A. S.

Hæmolytic reaction following blood transfusion. H. Mandelbaum (Ann. int. Med., 1939, **12**, 1699—1708).—A case of intra-group incompatibility is reported. The donor belonged to sub-group A_1, the recipient to sub-group A_2. C. A. K.

Direct or indirect blood transfusion. F. Roth (Dtsch. med. Wschr., 1939, **65**, 802—804).—A review. A. S.

Tolerance of repeated hæmorrhages in blood donors. H. Reiher (Dtsch. Arch. klin. Med., 1939, **61**, 211—223).—17 donors who gave 10·7—17·5 l. of blood in the course of 4 years showed no changes in hæmoglobin concn., red and white cell count, thrombocytes, or serum-proteins. Three donors developed moderate anæmia and gastric achylia. A. S.

Changes of protein and colloid osmotic pressure of renal blood. II. Influence of venesection and blood transfusion. III. Influence of diuretics. K. Shida (Tohoku J. exp. Med., 1939, **35**, 394—410, 411—436).—II. 20% of the circulating blood of rabbits was removed by venesection. Serum-

protein, colloid osmotic pressure, and hæmoglobin are more reduced in the arterial blood than in the renal venous blood. Colloid osmotic pressure is proportionally more reduced than plasma-protein, particularly in the venous blood. Globulin-N is more reduced than total N or albumin-N. 20 c.c. of blood per kg. body-wt. were injected intravenously into rabbits. Hæmoglobin, plasma-protein, and colloid osmotic pressure are increased in arterial and venous blood. Plasma-protein and colloid osmotic pressure are more reduced during the circulation through the kidney than in the normal control. This is more marked in serum-albumin than serum-globulin.

III. Theoscine increases hæmoglobin, plasma-protein, and colloid osmotic pressure, more markedly in the venous renal blood than in arterial blood. Colloid osmotic pressure increases proportionally less than the serum-protein, so that the osmotic pressure per % of protein falls. Salyrgan causes a slight fall in the arterial blood and a slight rise in the renal venous blood of hæmoglobin, plasma-protein, and colloid osmotic pressure. Total N, albumin-N, and globulin-N fall after the injection below normal val., total N and globulin-N more than albumin-N. Hypertonic glucose causes a considerable fall in arterial blood and a slight fall in renal venous blood of hæmoglobin, protein, and colloid osmotic pressure. Colloid osmotic pressure falls more than protein. E. R.

Blood volume and blood transfusions. U. Wetzel (Klin. Woch., 1939, **18**, 456—458).—The blood vol. was raised in 15 of 18 cases 30 min. after a transfusion of 400—500 c.c. E. M. J.

Diurnal variations of hæmoglobin in the blood of normal men. E. F. McCarthy and D. D. van Slyke (J. Biol. Chem., 1939, **128**, 567—572).—Hæmoglobin, determined by the manometric CO capacity method in blood of 18 young men from 9 a.m. to 11 p.m. at 2—3-hr. intervals, was usually lower in the evening than the morning. Range between highest and lowest vals. averaged 1·3 vols.-% on a mean of 19·9 vols.-% total CO capacity. T. F. D.

Hæmoglobin determination, hæmometer calibration, and optical constants. (A) G. Barkan. (B) L. Heilmeyer and I. von Mutius (Dtsch. Arch. klin. Med., 1939, **184**, 114—117, 118—120).—Polemical. A. S.

Methæmoglobin formation and pyridine. H. Riedel (Arch. exp. Path. Pharm., 1939, **192**, 39—42).—Dilute aq. solutions of pyridine form methæmoglobin on keeping in contact with hæmolysed blood (cf. A., 1939, III, 66). H. Bl.

Iron metabolism in hæmochromatosis. A. Marble and R. M. Smith (Ann. int. Med., 1939, **12**, 1592—1603).—Fe balance tests in a case of hæmochromatosis showed a daily retention of 1·8 mg. The Fe content of whole blood was normal (43—47 mg.-%). C. A. K.

Determination of carbon monoxide hæmoglobin. L. Breitenecker (Wien. klin. Wschr., 1939, **52**, 486—481).—A review. A. S.

Hæmolytic jaundice with macrocytic anæmia. C. J. Watson (Ann. int. Med., 1939, **12**, 1782—1796).—In familial hæmolytic jaundice the anæmia is microcytic; in the acquired type macrocytic anæmia occurs. Jaundice and anæmia did not increase in parallel. The marked increase of circulating erythrocytes seen immediately after splenectomy is probably due to the action of adrenaline on the spleen. Adrenaline injection after operation has no effect. C. A. K.

Pathogenesis of hæmolytic jaundice. G. Lepel (Dtsch. Arch. klin. Med., 1939, **183**, 552—557).—Saline extracts were made from the spleen of a patient who died of hæmolytic jaundice. The more the extracts were diluted the greater became their hæmolytic properties. The hæmolysin is thermostable; it acts in the presence of serum complement. A. S.

Hæmorrhage in jaundice. C. F. W. Illingworth (Lancet, 1939, **236**, 1031—1035).—The prothrombin content of blood is probably a good criterion of hæmorrhagic tendency in jaundiced patients. Marked deficiency occurred in 3 cases who had post-operative bleeding, a smaller deficiency or normal vals. in 17 cases who had no bleeding. Vitamin-*K* increases the prothrombin content and was successfully used in 3 out of 4 cases. C. A. K.

Relationship of pyrrole-containing pigments to hæmoglobin synthesis. G. O. Kohler, C. A. Elvehjem, and E. B. Hart (J. Biol. Chem., 1939, **128**, 501—509).—The hæmoglobin production of Cu-deficient, anæmic rats with optimum Fe intake was not improved by chlorophyll, protoporphyrin, or bilirubin given orally or parenterally. Two rats receiving 20 and 40 mg. of chlorophyll daily excreted 53 and 57%, respectively, unchanged in the fæces and the remainder chiefly as probophorbide-*A* (or -*C*) and -*B*. E. M. W.

Coupled oxidation of ascorbic acid and hæmoglobin. I. R. Lemberg, J. W. Legge, and W. H. Lockwood (Biochem. J., 1939, **33**, 754—758).—The coupled oxidation of oxyhæmoglobin and ascorbic acid to yield choleglobin is not caused by H_2O_2 liberated in the autoxidation of the latter, since this autoxidation can be prevented without inhibiting the formation of choleglobin by the action of atm. O_2 but not by H_2O_2. P. G. M.

Function of spleen in retardation of shock from hæmorrhage. E. P. Lehman and C. V. Amole (Surgery, 1938, **4**, 44—50).—The splenectomised dog sustains repeated withdrawal of blood less well than the intact dog; the shock level is reached after less blood is lost and death ensues earlier. G. K. H.

Dualism of blood pigment. H. Fischer (Z. physiol. Chem., 1939, **259**, I—II).—Crystallisation of a mixture of 3 parts of mesoporphyrin-IX ester and 1 part of -II ester from $CHCl_3$–methyl alcohol gives an apparently homogeneous substance, m.p. 207°, the same as that of "natural" meso-ester, and the m.p. of a mixture is not depressed. Accordingly "natural" mesoporphyrin is a mixture of -IX and -II and hence "natural" hæmin consists of a mixture of the corresponding vinyl compounds. J. N. A.

Hæmolymph nodes of the rat (iron pigment lymph nodes). H. Selye and V. Schenker (J.

Anat., Lond., 1939, **73**, 413—415).—Brown lymph nodes containing Fe pigment are const. in the adult rat; they have no free circulating blood as in a true hæmolymph gland. An ordinary lymph gland can change into an Fe pigment lymph node under the influence of damaging agents: the sinuses are invaded by erythrocytes which are then engulfed by macrophages and transformed into brown Fe pigment granules. Nephrectomy shows that the blood-destroying function of the renal lymph node depends on the presence of the kidney. E. E. H.

Formation of hæmolymph nodes during "alarm reaction." H. Selye and V. G. Foglia (Amer. J. Anat., 1939, **64**, 133—142).—The "alarm reaction" was produced in rats by exposure to low temp., formaldehyde injections, and severe muscular exercise; in each case there was a generalised invasion of the sinuses of the lymph nodes with red blood corpuscles; this invasion was greatly facilitated by the previous intravenous injection of isotonic NaCl solution. The red cells are removed by phagocytosis within a few days. H. L. H. G.

Origin and nature of normal synovial fluid. M. W. Ropes, G. A. Bennett, and W. Bauer (J. clin. Invest., 1939, **18**, 351—372).—Normal bovine synovial fluid is a relatively acellular clear straw-coloured viscous liquid; the nucleated cell count is 131 per cu. mm., relative viscosity 3·72, and p_H 7·42. The total protein concn. is 1·02 g.-%, of which 0·71 g.-% is albumin, 0·17 globulin, and 0·14 mucin; fibrinogen is absent. The distribution of electrolytes and non-electrolytes between serum and fluid is in accord with the view that synovial fluid is a dialysate of plasma. The origin of the mucin is unknown. The effect of mucin on the colloid osmotic pressure and Ca concn. of synovial fluid indicates that in addition to its lubricant effect, mucin influences the exchange of water and other substances between the blood and the joint cavity. C. J. C. B.

Serum-sulphate. E. G. Wakefield, M. H. Power, and N. M. Keith (Arch. intern. Med., 1939, **63**, 679—685).—A modified technique for determination of serum-SO_4 is described. Normal vals. range from 2·4 to 5 mg.-%. In patients with mild renal insufficiency increased SO_4 vals. sometimes occurred without changes in the blood-urea. C. A. K.

Internal environment of *Eriocheir sinensis* and its adaptation to changes in salinity. J. Portier and A. Drilhon (Compt. rend., 1939, **208**, 841—842).—When the crab is placed in sea-water the [Cl′], [$Na^{\cdot}$], and [$K^{\cdot}$] of the hæmolymph increase until isotonicity is achieved. The [$Ca^{\cdot\cdot}$] is unchanged. When the crab is immersed in a solution more conc. than sea-water the tissues are always somewhat hypotonic with respect to the outside fluid, and the univalent ions and Ca in the hæmolymph are much increased. J. L. D.

Serum-potassium and -sodium in pre-eclamptic conditions. F. Posatti and W. Beiglböck (Mschr. Geburtsh. Gynäk., 1938, **108**, 237—246).—Serum-K and -Na in pre-eclamptic conditions are normal; if insulin is given serum-K decreases and -Na increases. S. Sch.

Sodium, potassium, and chlorides of serum in experimental traumatic shock, induced hyperpyrexia, high intestinal obstruction, and duodenal fistula. J. D. Bisgard, A. R. McIntyre, and W. Osheroff (Surgery, 1938, **4**, 528—547).—In traumatic shock there was no consistent alteration of serum-Na, -K, or -Cl. Hyperthermic shock was associated with a marked rise of serum-K, the -Na and -Cl remaining unchanged. No evidence was obtained that K contributed to the production of symptoms or death in high intestinal obstruction or duodenal fistulæ. G. K. H.

Blood-potassium during experimental shock. R. L. Zweher and J. Scudder (Surgery, 1938, **4**, 510—527).—The blood-K content of the normal animal is remarkably const. It rises in cats in which shock has been produced by hæmorrhage or trauma. Inadequate K regulation is a factor in shock. G. K. H.

Determination of potassium in serum. R. S. Hubbard and H. R. Garbutt (Amer. J. clin. Path., Tech. Suppl., 1939, **3**, 119—123).—This modification of Kramer and Tisdall's method is applicable to concns. between 5 and 80 mg.-% of K in serum; by diluting the serum with saline it can be applied to higher concns. C. J. C. B.

Blood-sodium chloride content and gastric disease. W. Heimberger (Z. ges. exp. Med., 1939, **105**, 337—344).—Gastric diseases are not characterised by sp. blood-NaCl concns. Blood-NaCl responds only feebly to gastric secretory processes. Blood- and urinary NaCl are in most cases independent. A. S.

Serum changes in infectious diseases and burns. K. Stenger (Klin. Woch., 1939, **18**, 576).—16 of 24 cases of severe infection or burns showed a raised serum-K and lowered -Cl. E. M. J.

Blood changes in manic-depressive psychoses. H. Tómasson (Acta Psychiat., Kbn., 1939, **13**, 517—526).—In patients with manic-depressive psychosis spectrographic determinations of blood-Ca and -Na showed greater variations than occur in normals. W. M. H.

Effect of acacia on the blood. R. L. Jackson and L. Frayser (J. Pharm. Exp. Ther., 1939, **65**, 440—452).—Following intravenous injection of acacia (1 g. per kg., 15% solution) in dogs, the plasma vol. rises, but returns quickly to normal, and the acacia decreases rapidly, although a small residue remains in the blood indefinitely. Decrease in total protein is proportionately greater than the increase in plasma vol. Protein regeneration is delayed, but increased by a high-protein diet. Hæmoglobin, cell vol., and red blood cell count decrease markedly and regenerate slowly. E. M. S.

Gum arabic as an infusion liquid. J. A. Maas (Quart. J. Exp. Physiol., 1938, **28**, 315—322).—Certain samples of gum arabic when injected into rabbits as 6% solutions in physiological saline produced shock. Na arabinate prepared from a sample of gum arabic containing Ca as the only cation and which had been proved not to produce shock, was

immediately fatal to rabbits; it also removed Ca from solutions of $CaCl_2$, the relation between Ca removed and Na arabinate used being hyperbolic. In the anæsthetised rabbit, the blood pressure is reduced by injection of Na arabinate but recovery takes place if $CaCl_2$ is injected. The contractions of the isolated heart of the frog and rabbit are diminished after addition of Na arabinate to the perfusion fluid. It is recommended that gum arabic for injection should consist of pure Ca arabinate. T. S. G. J.

Blood-lactic acid in patients with pulmonary tuberculosis and its increase after work. Z. Yosizumi (Tohoku J. exp. Med., 1938, **34**, 214—230). The increase after work is greater than in healthy persons. A definite relationship of the blood-lactic acid to the sedimentation rate of red cells and to vital capacity was found. F. Ja.

Influence of narcotics, naphthylamines, and picrotoxins on restoration of blood-protein and the colloid osmotic pressure after plasmapheresis. H. Sibuya (Tohoku J. exp. Med., 1939, **35**, 123—143).—In rabbits after plasmapheresis, chloral hydrate first slows the decrease and later the restoration of the plasma-protein, while the fall of osmotic pressure occurs rapidly and its restoration is at the normal rate. Luminal, prominal, and naphthylamine delay the restoration of the proteins but have little effect on osmotic pressure. Picrotoxin retards considerably the restoration of the proteins and osmotic pressure. E. R.

Proteins and colloid osmotic pressure of blood perfusing a skeletal muscle. I. Normal dogs. II. Dogs deprived of kidney function. S. Kusano (Tohoku J. exp. Med., 1938, **34**, 246—259, 260—276).—The arterial and venous blood of an isolated gastrocnemius muscle was examined for hæmoglobin, serum-protein, non-protein-N, globulin-N, albumin-N, and the plasma colloid osmotic pressure in normal dogs, after hæmorrhage, after removal of the kidneys, and after ligation of both ureters. The muscle in normal dogs removes small amounts of water from the blood and gives off globulins. In the above pathological conditions globulin-N and non-protein-N of the perfusing blood are specially raised. F. Ja.

Separation of serum-globulins by electrophoresis. G. Blix (Z. ges. exp. Med., 1939, **105**, 595—598).—Globulin-α, -β, and -γ were electrophoretically separated by means of a Tiselius apparatus. Normal serum-globulin consists of 75% of γ-globulin; β-globulin is $\frac{1}{6}$th, α-globulin $\frac{1}{14}$—$\frac{1}{15}$ of the total globulin. α-Globulin is doubled in pneumonia. A. S.

Residual nitrogen of blood after scalding. G. Stolfi and L. Provenzale (Boll. Soc. ital. Biol. sperim., 1939, **14**, 116; cf. A., 1937, III, 172).—Partial immersion of rabbits in water at 100° for 6 sec. may increase plasma non-protein-N (mainly uric acid- and creatine + creatinine-N). F. O. H.

Proteins and colloid osmotic pressure of blood perfusing skeletal muscle. Dogs (1) with liver damage, (2) with hyper- and hypo-thyroidism. S. Kusano (Tohoku J. exp. Med., 1938, **34**, 357—372, 373—385).—The amount of hæmoglobin, serum-protein, residual N, globulin-N, albumin-N, and the colloid osmotic pressure were determined in the arterial and venous blood of the gastrocnemius muscle (*a*) before and after ligation of the hepatic artery and after P poisoning, (*b*) in dogs fed with thyroxine and in others after thyroidectomy. The results are tabulated. F. Ja.

Changes of protein and colloid osmotic pressure in arterial and venous blood of kidney. I. Healthy and damaged kidneys. K. Shida (Tohoku J. exp. Med., 1939, **35**, 304—322).—Rabbit's kidneys were damaged by U nitrate or cantharidin; there is a greater difference of protein content (particularly globulin) between arterial and venous blood than in normal animals. The albumin/globulin ratio is less diminished than in normal controls. The colloid osmotic pressure falls more than in normal animals, but the pressure per g. of protein remains the same in the blood of the renal veins of the damaged kidneys as in the arterial blood. E. R.

Influence of large amounts of water on serum-protein and colloid osmotic pressure in health, hypertension, and renal disease. K. Shida (Tohoku J. exp. Med., 1939, **35**, 271—303).—7 healthy subjects, 12 with compensated hypertension, 9 with chronic glomerulo-nephritis, and 7 with secondary chronic nephritis or malignant hypertension were given 1500 c.c. of water to drink; samples of blood were taken immediately before drinking and after 2 and 24 hr. In normal people the blood is more conc. after 2 hr., there is a loss of protein of low mol. wt. into the tissue, and a rise of protein of higher mol. wt. from protein depôts, causing a fall of osmotic pressure per g. of protein; after 24 hr. the blood is more conc., and the plasma-proteins, colloid osmotic pressure, and the pressure per g. of protein increased. In compensated cases of hypertension the blood may still be in the primary phase of hydræmia or may be already more conc. than normal. After 24 hr. the exchange of protein between tissue and protein depôts still occurs in limited degree. In chronic glomerulo-nephritis hydræmia is still present after 2 hr. in all cases. Total proteins, total colloid osmotic pressure, and pressure per g. of protein are all diminished. After 24 hr. exchange of protein between depôts and tissues still continues. In marked renal insufficiency there is a loss of low-mol. wt. protein into the tissues after 2 hr. with corresponding decrease of the colloid osmotic pressure and the pressure per g. of protein. The same occurs still after 24 hr., showing a slow exchange of protein between blood and protein depôts. E. R.

Plasma-lipins in acute schizophrenia. E. Jokivartio and T. Kalaja (Acta Psychiat., Kbn., 1939, **13**, 667—675).—In schizophrenics, ether-sol. plasma-phosphatides were lower than in healthy controls, and not significantly altered by cardiazol or insulin treatment. W. M. H.

"Vasodepressive substance" in blood. K. Fuzii (Tohoku J. exp. Med., 1939, **35**, 264—270).—Defibrinated rabbit's blood and rabbit's blood prepared with trichloroacetic acid or by the Barsoum-

Gaddum method contains a substance which increases the contractions of isolated guinea-pig intestine, depresses the blood pressure of narcotised cats (even after atropine), and causes gastric secretion in dogs with a Pavlov pouch. Bleeding, cooling, or administration of adrenaline does not change the concn. of this substance in blood. E. R.

Fine structure of [plasma-]proteins as expression of physical inheritance. E. Abderhalden (Forschung. u. Fortschritte, 1939, **15**, 177—178).—The Abderhalden "defence proteinase reaction," which consists in injecting into a rabbit the protein from one animal and ascertaining whether the "defence" proteinases produced in the rabbit act on the protein derived from another animal, has been applied to investigate the degree of similarity of the plasma-proteins of father, mother, and child in the case of sheep and pigs. When according to the reaction the plasma-protein was related to that of the father and not to that of the mother, the general physical features of the child resemble those of the father. Similarly resemblance of child with mother in respect of blood-protein was associated with a resemblance in respect of physical features. W. O. K.

Determination of urea in chicken blood. S. F. Howell (J. Biol. Chem., 1939, **128**, 573—578).—Urea-N levels of chicken blood determined by a method involving hydrolysis by cryst. urease were much lower than those usually reported, a mean val. of 0·7 mg. per 100 ml. being found in health and larger vals. in disease. T. F. D.

Hourly variation of urea content in human blood and in human milk after internal use of urea, and its effect on Arakawa's reaction. G. Sugihara (Tohoku J. exp. Med., 1938, **34**, 434—438).—Urea increases and also decreases earlier in blood than in milk. The Arakawa reaction is not influenced. F. Ja.

Blood-urea in cattle during hæmorrhage. P. Rossi (Compt. rend. Soc. Biol., 1939, **130**, 615—617).—Only normal variations in blood-urea were observed. H. G. R.

Serum-cholesterol after sea and sun bathing. H. Curschmann (Klin. Woch., 1939, **18**, 434—436).—Serum-cholesterol was raised after a 2 hr. sunbath or 10 min. sea bathing in 22 subjects; the rise was less in acclimatised or pigmented persons. E. M. J.

Blood-cholesterol content in artificial fever. F. Walinski and I. Bleisch (Dtsch. med. Wschr., 1939, **65**, 717—718).—Blood-cholesterol is diminished during artificial hyperpyrexia. A. S.

Nature of combined carbohydrate in blood. C. Dumazert and G. Penet (Compt. rend. Soc. Biol., 1939, **130**, 558—560).—Carbohydrates with a labile linkage to protein (hydrolysed by dil. acids) can be fermented by yeast whereas those with a stronger linkage (*e.g.*, glucosamine) cannot. H. G. R.

Leech method of blood analysis; new micro-method. VII. Determination of blood-sugar. H. Ohsako (Tohoku J. exp. Med., 1939, **35**, 155—156).—The leech is put on the skin for 10—30 min. and blood removed from it with a syringe. The results varied by ±4·7% from those obtained from blood removed directly from the patient's vein. E. R.

Behaviour of blood-ketones during exercise in the untrained. H. Winkler and F. Hebeler (Klin. Woch., 1939, **18**, 596—598).—Untrained persons showed a great rise in serum-ketones after severe exercise; this rise reacts to the administration of glucose or pancortex but not to adrenaline. The ketone level remains normal in trained persons. E. M. J.

Linear relation for calculating blood-sugars by the timed ferricyanide method. E. M. Abrahamson (Amer. J. clin. Path., Tech. Suppl., 1939, **3**, 123—128).—Graphs are given. C. J. C. B.

Blood-sugar variations in normal and in sympathectomised dogs. L. Brouha, W. B. Cannon, and D. B. Dill (J. Physiol., 1939, **95**, 431—438).—When sympathectomised dogs, with or without adrenal medulla, recover from the operation, the regulation of the blood-sugar during exercise, after ingestion of glucose and after adrenaline injection, is normal, even though no adrenine or sympathin can be liberated. The liver liberates sugar when the sugar level in the blood drops; the amount of sugar in the blood may be the factor which regulates its release from the liver; or the sugar-regulating factor of the pituitary (Houssay) is elaborated fast enough to maintain a normal blood-sugar in the exercise experiments. When an excess of insulin is to be dealt with, the removal of sugar from the blood is so fast that mechanisms available for mobilisation fail to keep pace; in this circumstance, the proper balance cannot be maintained in the absence of adrenin. Sympathectomised dogs remain sensitive to insulin indefinitely, due merely to denervation of the adrenal glands. J. A. C.

Histaminolytic capacity of blood. I. Marcou (Compt. rend. Soc. Biol., 1939, **130**, 573—575).—When 30 μg. of histamine acid phosphate were placed in 10 c.c. of blood at 37°, 50% was destroyed in 30 min. Since the destruction was less in arterial than in venous blood this cannot be due to liberation of histaminase by the lungs. This histaminolytic power of the blood would prevent a rise of histamine in the blood perfused through an isolated heart. P. C. W.

Determination of histamine in blood. G. V. Anrep, G. S. Barsoum, M. Talaat, and E. Wieninger (J. Physiol., 1939, **95**, 476—484).—Code's method of extraction gives a higher histamine equiv. of blood or of blood corpuscles than that obtained by Barsoum and Gaddum's method. Code's extract contains an alcohol-insol. substance which contracts the guinea-pig's ileum and is included in Code's vals. of the histamine equiv. of the blood; this alcohol-insol. substance is derived from the red blood cells and increases in amount on defibrination; it differs from histamine also in its action on the atropinised rectal cæcum of the fowl rendered insensitive to histamine, its resistance to the action of histaminase, and its instability in blood kept under aseptic conditions for 24 hr. J. A. C.

Influence of anæsthetics on hydrolysis of acetylcholine in rabbit's blood. A. Ahlmark and T. G. Kornerup (Skand. Arch. Physiol., 1939, **82**, 39—48).—The acetylcholine-esterase content of rabbit's blood is diminished by ether, avertin, and amytal anæsthesia. Variable results were obtained under urethane anæsthesia. Chloralose and pernocton do not change the esterase content. A. S.

Influence of some constituents of serum on gas metabolism of tissue *in vitro*. H. Yamamoto (Tohoku J. exp. Med., 1938, **34**, 439—464).—Change of the concn. of KCl and $CaCl_2$ in Ringer's solution or in dialysed serum to 0·01, 0·04, or 0·06%, *i.e.*, not differing very much from the physiological vals., has no or only a slight depressing effect on the respiration of rabbit kidney cortex *in vitro* (Warburg's method). Results are tabulated. F. Ja.

Variations in the resistance of erythrocytes *in vivo* to the action of snake venom. J. Vellard (Compt. rend., 1939, **208**, 669—671).—Intravenous injections (dog) of hæmolytic but non-coagulating venom (*Naja*, *Elaps*) causes rapid destruction of red cells. In smaller doses, resistance to hæmolysis by shaking or by hypotonic solutions reaches a min. in 2—10 min. and returns to normal some hr. after the hæmolysins leave the blood. The resistance to hæmolysins of red cells increases rapidly after injection of venom. This period of increased resistance is preceded by a brief period of diminished resistance which is not easily observed after intravenous injection. With hæmolytic and coagulating venom (*Bothrops*, *Crotalus*), the resistance to hæmolysis increases in proportion to the tendency to coagulation. The more fragile the cells are to mechanical treatment and hypotonic solutions, the greater is the hæmolytic tendency of the venom. J. L. D.

Acceleration of "tryptic hæmolysis" by embryonic extract. H. Herrmann and A. Fischer (Enzymologia, 1939, **6**, 140—142).—The hæmolysis of erythrocytes (hen, rabbit) by trypsin is accelerated by extract of chick embryo. The rate of hæmolysis increases as the concn. of the extract increases and, in presence or absence of the extract, as the trypsin concn. increases. The rate decreases, in the presence or absence of the extract, as the erythrocyte concn. increases. The activity of the extract is not affected by heating at 80° for 15 min. The activities of hen serum, hen muscle extract, extract of calf embryo, and rabbit muscle extract are 80—90, 30—40, 20—30, and 0%, respectively, of that of extract of chick embryo. The hæmolysis-accelerating activity of extract of chick embryo is probably not identical with its growth-promoting activity. W. McC.

(vi) VASCULAR SYSTEM.

Investigations on physiology of circulation in the Institute of Physiology at Osaka in the last 10 years. K. Sasagawa (Coll. papers to Prof. Isikawa, Kyoto, 1938, 150—281).—A review on: (1) sport as a way to physical fitness (203 references); (2) influence of "ultra-acoustic" waves on living organisms (150 references); (3) investigations on physiology of excitation by means of cathode-ray oscillograph (23 references). W. Bu.

Circulation of blood in the silkworm. T. Yokoyama (Proc. Imp. Acad. Tokyo, 1939, **15**, 94—97).—In the silkworm the blood enters the dorsal vessel only through the posterior one or two pairs of ostia, flows forward in the vessel, emerges from the anterior two or three pairs of ostia and from the anterior open end, and returns through the body cavity, thus completing the circulation. W. O. K.

Cardiac and respiratory neurosis. H. Heckscher (Acta med. scand., 1939, **99**, 162—203).—A discussion of cases and theories. C. A. A.

Cardiac activity during epileptic seizures. T. C. Erickson (Arch. Neurol. Psychiat., Chicago, 1939, **41**, 511—518).—E.c.g. tracings taken during 54 epileptic seizures of various types did not reveal any asystoles. Changes in blood pressure during seizure were variable. A. M. B.

Capillarisation and nutrition of the heart. VI. A. Vannotti and A. Blunschy (Z. ges. exp. Med., 1939, **105**, 447—462).—Severe ischæmia of the circular muscle layer of the heart was observed in experimental aortic stenosis in the rabbit; congestion occurred in the inner myocardial layer. The blood supply of all layers is increased in experimental aortic insufficiency. A. S.

Elastic properties of beating tortoise ventricle with particular reference to hysteresis. H. Kabat and M. B. Visscher (Amer. J. Physiol., 1939, **125**, 437—449).—The diastolic elasticity curves of the isolated ventricle were studied in the tortoise heart under various mechanical conditions. Small hearts were more satisfactory than large because in the latter the thickness of the wall made diffusion inadequate as a means of oxygenation; the size is especially important because anoxia is one of the factors which modify the elasticity of the ventricle. Short periods of application of high pressure result in a reversible decrease in elasticity (the hysteresis effect), while longer periods of pressure application lead to a more permanent lowering of elasticity (elasticity fatigue). Decreased elasticity in the state or anoxia is reversible; work capacity decreases when elasticity falls but the former may increase more than the elasticity in the recovery from prolonged stretching. At relatively high filling pressures the work capacity is greater when the elasticity is low. M. W. G.

Conductivity of perfusion fluid of frog's heart under abnormal atmospheric pressure. S. Kodama (Tohoku J. exp. Med., 1938, **34**, 403—412).—This was increased under high atm. pressure and decreased under low pressure. F. Ja.

Electrocardiogram of the embryonic heart. E. C. Hoff, T. C. Kramer, D. Dubois, and B. M. Patten (Amer. Heart J., 1939, **17**, 470—488).—The e.c.g. was recorded in chick embryos from the age of 36 hr. to 4 days. At first the electrical changes were small and indefinite but by 4 days normal adult *P*, *QRS*, and *T* complexes have appeared, at a time when the heart possesses no nerve supply or specialised conducting tissue. C. A. K.

Rightward deviation of axis of T wave. R. Ashman and E. H. Hidden (Ann. int. Med., 1939, **12**, 1682—1689).—Rightward deviation of the electrical axis of the T wave is common in disease of the left ventricle. The T axis is obtained by plotting the ratio T_1 height/T_3 height against the average electrical axes of the QRS complexes. C. A. K.

Changes in electrocardiogram and cardiac filling. W. Weitz and H. Warnecke (Klin. Woch., 1939, **18**, 441—443).—Alterations in cardiac filling brought about by changes in posture, transfusion, or venesection in man affected the height of the R and T waves of the e.c.g. in a no. of cases. E. M. J.

Electrocardiographic changes and concentration of calcium in serum following intravenous injection of calcium chloride. H. E. Hoff, P. K. Smith, and A. W. Winkler (Amer. J. Physiol., 1939, **125**, 162—171).—Dil. $CaCl_2$ solution was injected intravenously into dogs (under morphine, amytal, or atropine and morphine) at a uniform rate sufficient to produce a continuously rising concn. of Ca in the serum; at intervals during the injection blood samples were withdrawn and analysed for Ca. It was thus possible to follow the appearance and evolution of the e.c.g. changes and to compare them with the simultaneous concns. of serum-Ca. The changes consist first of a slowing phase, frequently associated with T wave changes and changes in auriculo-ventricular conduction, apparent at Ca concns. ranging from 15 to 65 mg.-%. There is then a rapid phase ending in ventricular fibrillation, apparent at Ca concns. from 25 to 90 mg.-%. A second slowing phase occurs in animals surviving the rapid phase; this consists of general depression ending in cardiac arrest without fibrillation and is apparent at Ca concns. of 70—190 mg.-%. M. W. G.

Electrocardiographic changes following intravenous administration of magnesium sulphate in dogs. T. R. van Dellen and J. R. Miller (J. Lab. clin. Med., 1939, **24**, 840—843).—Atropine given before injection of Mg had no effect, nor when given after Mg in dogs with sectioned vagi. This suggests that the effect of the Mg is direct, not central. C. J. C. B.

Negative T wave in lead 3 during deep inspiration. H. Zothe (Dtsch. Arch. klin. Med., 1939, **184**, 85—99).—A negative T_3 indicates myocardial damage if it remains negative during max. inspiration. The conversion of a negative T_3 into a positive deviation during inspiration in normal subjects is attributed to a shift in the electrical axis of the heart. A. S.

Left ventricular preponderance without arterial hypertension or aortic valve lesion. J. Waider (Dtsch. Arch. klin. Med., 1939, **184**, 65—77).—Left ventricular preponderance of the e.c.g. is a symptom of vascular disease even if the blood pressure is normal. In some cases it is a sign of "myogenic" hypertrophy of the heart. A. S.

Irreciprocal conduction of excitation between auricle and ventricle. K. Kōtuka (Coll. Papers to Prof. Isikawa, Kyoto, 1938, 134—149).—In frog hearts in winter with only the sinus removed or with the lateral part between auricle and ventricle intact, conduction was reciprocal. If the auricle and ventricle were connected only by the auricular septum, conduction was irreciprocal, *i.e.*, only from auricle to ventricle. Addition of (*a*) muscarine caused reciprocal transmission, which effect was counteracted by atropine; similar effects were obtained with (*b*) adrenaline and ergotoxine respectively. Neither (*a*) nor (*b*) was influenced by curare. In frog hearts in summer removal of the sinus gave irreciprocal conduction; adrenaline and muscarine effects were as in winter frogs. Nicotine had no influence on the adrenaline effect. Toads in summer reacted similarly to frogs in summer. W. Bu.

Vascular response to amyl nitrite and histamine at different ages. I. Gelman and S. Braun (Arch. Sci. biol. U.R.S.S., 1937, **44**, 87–102).—The effect of inhalation of amyl nitrite was studied on 126 children, 29 adults, and 38 elderly people. The general effects were the same in young and old but the e.c.g. showed marked differences in children and adults on the one hand and elderly people on the other. In children the symptoms are sometimes acute and similar to those of coronary thrombosis. The effect of histamine was studied on 11 children and 11 elderly persons. The general reactions were identical in both, but started later and lasted longer in the old. T. T.

Effects of exercise in a gas mask on the heart. H. Zettel and A. Fink (Klin. Woch., 1939, **18**, 458—461).—The e.c.g. showed changes in 24 normal adults wearing a gas mask and running for 1 min. in a basement carrying 28 lb. extra wt. The pulse rate and systolic blood pressure were raised. The P wave was often shortened, and negative P_{III} and T_{III} became positive; the PQ and ST intervals were shortened. QRS may be lengthened; the T wave is usually flattened. Subjective sensations were common. E. M. J.

Electrocardiographic changes in pulmonary embolism. T. M. Durant, I. W. Ginsburg, and H. Roesler (Amer. Heart J., 1939, **17**, 423—430).—Transient right bundle branch block and other changes in the e.c.g. occurred within a few hr. of the onset in 3 cases of pulmonary embolism. C. A. K.

Effect on electrocardiogram of removing successive portions of the heart. A. Clerc and A. Quinquaud (Compt. rend. Soc. Biol., 1939, **130**, 518—520).—The elevation of the RS complex above the isoelectric line when the apex of the heart is removed (chloralosed dog) points to a predominance of the potential at the electrode placed on the base of the heart. If successive slices of the heart are removed starting from the apex and approaching the base the elevation of the S wave above the isoelectric line becomes more pronounced until it becomes a dome-like wave completely obliterating the T wave. P. C. W.

Significance of the indifferent electrode in chest leads. F. Nagl (Wien. klin Wschr., 1939, **52**, 417—429).—The chest electrode was used according to the recommendations of the Cardiac Society. The lowest potentials for T in the chest e.c.g. were obtained with the indifferent electrode on

the left leg when T_1 was negative; with negative T_1 and T_2, T_4 was low when the electrode was placed on the right arm, with negative T_3 when the electrode was placed on left arm. With damage to the left ventricle, leads from left leg or right arm are recommended, with right ventricular lesion those from the left arm. The elevation of the *S–T* segment is preferably demonstrated, with an infarction of the anterior wall, with leads from chest and right arm or left foot; with an infarction of the posterior wall, leads from chest and right or left arm are recommended. A. S.

Precordial leads. R. W. Robinson, A. W. Contratto, and S. A. Levine (Arch. intern. Med., 1939, **63**, 711—731, 732—751.)—Precordial leads were taken from 9 points in normal subjects, cases of myocardial infarction, and cases of other kinds of heart disease. In all cases the most informative curve was obtained with the electrode over the apex beat. Deviation of the *S–T* segment occasionally occurred when the conventional leads were unchanged in cases of anterior infarction. C. A. K.

Intramyocardial pressure and its relation to aortic blood pressure. J. R. Johnson and J. R. Di Palma (Amer. J. Physiol., 1939, **125**, 234—243).—Using cats, a method of optical recording is described for measuring directly the extent of the intramyocardial pressure at any desired depth in the wall of the left ventricle; the contour of such pressure curves is described. Simultaneously records of the pressure from the ventricular wall and from the aorta show that during the height of systole, there exists in the wall of the left ventricle a gradient of pressure decreasing from the deeper to the more superficial layers. In the depth of the myocardium this pressure is always greater than aortic pressure but in the superficial layers it may be equal to or even less than the pressure in the aorta and coronary arteries. M. W. G.

Experimental study of velocity of pulse wave propagated through the aorta. P. Dow and W. F. Hamilton (Amer. J. Physiol., 1939, **125**, 60—65).—Continuous curves showing changes in pulse wave velocity from aortic arch to femoral artery in dogs are given. The wave accelerates evenly over this range and measurements of the elasticity of rings cut from the aorta give results consistent with such an acceleration. The pulse wave velocity corresponds with different functions of the diastolic pressure in the thoracic and abdominal portions of the aorta. Electrical or reflex stimulation of the vagus nerves is accompanied by a slowing of the pulse wave in addition to that produced by lowering of the diastolic pressure; these effects occur at low and normal pressures in the abdominal aorta and at higher pressures in the thoracic aorta. M. W. G.

Influence of posture on circulation time. H. S. Mayerson, H. M. Sweeney, and L. A. Toth (Amer. J. Physiol., 1939, **125**, 481—485).—Least circulation times were determined on normal males, 20—38 years, by the method of Spier, Wright, and Saylor. This test depends on the time necessary for a definite localised sensation of heat to be produced when a solution containing $MgSO_4$, Ca gluconate, and $CuSO_4$ is carried in the blood stream from the site of injection (foot veins or antecubital vein of the left arm supported at heart level) to various points in the vascular system. Measurements (75) of the circulation times in the upright position indicate a marked retardation of blood flow in the lower extremities; this slowing is due primarily to stagnation or pooling in the vein of the extremities. M. W. G.

Normal heart volume in man. G. Liljestrand, E. Lysholm, G. Nylin, and C. G. Zachrisson (Amer. Heart J., 1939, **17**, 406—415).—The heart vol. was determined by simultaneous radiograms in 2 projections at right angles, in 101 healthy men aged 21 to 47; the vals. were 7·0—13·0 c.c. per kg. body-wt. and 250—490 c.c. per sq. m. of body surface. C. A. K.

***X*-Ray kymographic cardiac function test.** F. Kuhlmann and H. Schütt (Klin. Woch., 1939, **18**, 609—610).—A method for *X*-ray kymography of the heart during exercise is described. E. M. J.

Angina pectoris in spontaneous hypoglycæmia. J. Weinstein and B. Mattikow (Ann. int. Med., 1939, **12**, 1886—1890).—2 cases are reported. C. A. K.

Oxygen consumption and coronary flow of the innervated heart in relation to different types and degrees of work. K. Gollwitzer-Meier, C. Kroetz, and E. Krüger (Pflüger's Archiv, 1938, **240**, 262—281).—Using the experimental methods previously described (cf. A., 1938, III, 785), the energy exchanges in the dog's innervated heart–lung prep. were determined for various conditions of inflow and resistance. In cases in which reflex alterations of frequency were absent in spite of intact efferent innervation, the innervated heart still required less O_2 than the denervated for the same work. The efficiency was greater in overcoming resistance than in dealing with inflow. In preps. showing a frequency response the effect was profound. If the resistance was raised the depressor reflex decreased frequency, O_2 consumption, and the excessive coronary flow. If the inflow was augmented the Bainbridge reflex increased frequency, O_2 consumption, and the insufficient coronary flow. Thus these reflexes correct the inadequacies of the dynamic regulation of the coronary flow, adjust the O_2 consumption, and adapt the heart to the particular type of work imposed, reacting to both increase and decrease. H. Ro.

Effect of polarising currents on the heart of the eel. H. Marduel (Compt. rend. Soc. Biol., 1939, **130**, 666—667).—Two non-polarisable electrodes are placed on the isolated heart, one on the bulbus arteriosus, the other on the sinus. If the latter is made the negative pole the tonus is increased, the rhythm accelerated, and the amplitude diminished. Opposite effects are obtained when the sinus electrode is positive. P. C. W.

Circulation in mitral disease. E. Edens (Klin. Woch., 1939, **18**, 405—410).—A review. E. M. J.

Blood pressure following destruction of stellate ganglia and spinal cord. H. Hermann, F. Jourdan, G. Morin, and J. Vial (Compt. rend. Soc. Biol., 1939, **130**, 661—662).—The blood pressure in a dog following removal of both stellate ganglia and subsequent destruction of the spinal cord up to and

including Th 1 fell rapidly to 70% of its original val. There was a slow recovery and 30—50 days after the operation the blood pressure was 88% of normal. P. C. W.

Control of arterial pressure by sinus nerves in eviscerated dog. F. JOURDAN (Compt. rend. Soc. Biol., 1939, **130**, 662—663).—In the eviscerated dog section of the sinus nerves still produces hypertension. P. C. W.

Rôle of vagus in cardio-accelerator action of atropine in sympathectomised dogs. L. BROUHA and S. J. G. NOWAK (J. Physiol., 1939, **95**, 439—453).—Dogs completely sympathectomised in 2—4 stages show in response to atropine no acceleration above the " denervated–adrenal-inactivated " heart rate for some days following the last operation. After this interval (usually 20 days) totally sympathectomised dogs show after atropine a marked cardiac acceleration (210—220 beats per min.), which represents a shift of function to a new or potential centre; this vicarious effect requires a certain length of time for its establishment. A chronically sympathectomised dog re-establishes cardio-accelerator function not through sympathetic regeneration but through latent mechanism which gradually develops its sensitivity after the normal accelerator mechanism is destroyed. The cardiac acceleration is produced by fibres contained in the vagus and originating in the vagal nucleus. J. A. C.

Rôle of vagus in cardio-accelerator action of muscular exercise and emotion in sympathectomised dogs. L. BROUHA, S. J. G. NOWAK, and D. B. DILL (J. Physiol., 1939, **95**, 454—463).—The chronically, totally sympathectomised dog develops a cardio-accelerator response (eventually approaching normal response) to emotion and to muscular exercise and the heart rate may attain vals. of 195 and 268 beats per min. respectively. Some time after bilateral section of the vagi, emotional excitement does not increase the heart rate above 140. Bilateral vagotomy produces a striking reduction in the cardiac acceleration in response to muscular work; acceleration in the sympathectomised dog in response to emotion and work is due to a vagal cardio-accelerator mechanism; emotion and exercise are still capable of eliciting a slight acceleration, which is discussed with respect to body temp., chemical, metabolic, neurogenic, and respiratory factors. Capacity for muscular exercise is markedly reduced by bilateral vagotomy; breathing is by deep diaphragmatic movement and absence of panting. After vago-sympathectomy, temp. regulation during exercise is altered, and there is a marked increase in blood-lactate response to exercise. J. A. C.

Effect of acetylcholine on the perfused heart. E. M. DE ESPANES and C. A. MARTINEZ (Compt. rend. Soc. Biol., 1939, **130**, 673—675).—The arrest of the perfused heart of the toad by acetylcholine is only temporary in spite of continued perfusion. The concn. of acetylcholine can be increased slowly without arresting the heart. A sudden increase in concn. produces arrest. These effects are unchanged by eserine. P. C. W.

Choline ester [present] in frog's hearts without vagus stimulation. W. HEUBNER and V. RUNCAN (Naturwiss., 1939, **27**, 195).—Effects were observed in 44 out of 65 otherwise normal frogs' heart preps. which indicate liberation of acetylcholine without stimulation. This abnormality may have been due to a mild winter. R. S. C.

Effect of urea and narcotics on action of acetylcholine on frog's heart. F. HEIM (Arch. exp. Path. Pharm., 1939, **192**, 1—17).—Urea diminishes the action of acetylcholine while it favours hydration and permeability; narcotics (urethane and $CHCl_3$) increase the action of acetylcholine on the frog's ventricle (cf. A., 1939, III, 368). H. BL.

Barium and cardiac automatism. V. GRONCHI (Boll. Soc. ital. Biol. sperim., 1939, **14**, 149—152).—Ba has no direct toxic action on heart muscle (rabbit) but affects the nodal and conducting tissue. F. O. H.

Bezold effect: a forgotten action of veratrine on the heart. A. JARISCH and H. RICHTER (Klin. Woch., 1939, **18**, 185—187; cf. Bezold and Frith, Unters. a.d. physiol. Laboratorium in Würzburg, 1867, **1**, 95). E. M. J.

Pulmonary infarction by injection of an inert substance and production of histamine. H. DUQUESNE (Arch. int. Physiol., 1939, **48**, 123—126).—Rabbits injected intravenously with pumice stone in saline showed shock, and pulmonary infarcts in which histamine could be demonstrated. W. BU.

Production of histamine by the heart depending on the cardiac work. I. MARCOU (Compt. rend. Soc. Biol., 1939, **130**, 575—577).—The arterial blood in a Starling heart–lung prep. has a lower histamine content than the blood from the coronary veins. If, however, the arterial blood is withdrawn proximal to the resistance the work done by the heart is diminished and the difference in the histamine content disappears or may be reversed. The reversal is shown to be due to " back-flow " from the coronary artery under these conditions since the content of the coronary vein blood is still slightly higher than that of the left auricular blood. P. C. W.

Coronary dilator effect of adrenaline in absence of histamine. I. MARCOU (Compt. rend. Soc. Biol., 1939, **130**, 586—588).—Addition of ascorbic acid (1 mg. per c.c.) to the circulating blood in a Starling heart–lung prep. prevents the formation of histamine by the heart. The coronary dilator action of adrenaline is still produced. P. C. W.

Increased thyroxine sensitivity of the hyperactive heart muscle. H. SCHUMANN (Z. ges. exp. Med., 1939, **105**, 577—583).—Thyroxine diminishes heart-phosphagen of the resting rat. The glycogen and phosphagen contents of the heart are slightly diminished after exercise; adenyl pyrophosphate remains unchanged. Thyroxine considerably reduces the glycogen, phosphagen, and adenyl pyrophosphate content of the heart after exercise. A. S.

Heart during increased mechanical work. H. SCHUMANN (Klin. Woch., 1939, **18**, 507).—Glycogen, phosphagen, and adenyl pyrophosphate in

rat's heart muscle fall to half during exercise on the turning wheel (cf. Gollwitzer-Meier, A, 1939, III, 557). E. M. J.

Arterial hypertension. A. I. Jarotzky (Schweiz. med. Wschr., 1939, **69**, 469—472).—A review. A. S.

Circulation in hypertension. A. Böger and K. Wezler (Klin. Woch., 1939, **18**, 401—405).—A review. E. M. J.

Method for producing persistent hypertension by Cellophane. I. H. Page (Science, 1939, **89**, 273—274).—In dogs, the kidneys were freed from their bed, stripped of fat, and wrapped in Cellophane sterilised in alcohol. Hypertension developed and a level of 240 mm. Hg has been recorded. In many cases the raised blood pressure persisted for many months. W. F. F.

Arteriolar changes in the myocardium in diffuse arteriolar disease with hypertension, group IV. H. M. Odel (Proc. Staff Mayo Clin., 1939, **14**, 210—214).—In malignant hypertension structural changes in the myocardial arterioles occur, but are inconst. in degree and extent and less pronounced than in other organs; diffuse chronic myocardial fibrosis is greater and more frequent than in non-hypertensives. A. M. G.

Pathologic studies of the arterial system in severe hypertension. N. M. Keith (Proc. Staff Mayo Clin., 1939, **14**, 209—210).—A brief review. A. M. G.

Brain in malignant hypertension. E. F. Rosenberg (Proc. Staff Mayo Clin., 1939, **14**, 217—222).—In malignant hypertension the cerebral arterioles show increase in thickness of the walls with reduction of ratio of wall to lumen; the brain is injured by the vascular lesions. The cerebral injury gives rise to several distinct groups of symptoms each of which is secondary to a characteristic pathological change. The transient cerebral phenomena are associated with widespread lesions. A. M. G.

Experimental hypertension in the rat. J. T. Riaz and S. E. Levy (Amer. J. Physiol., 1939, **125**, 586—592).—Rats subjected to partial nephrectomy showed a progressive increase in arterial blood pressure over a period of 3 months; the average results were: normal blood pressure 110/60 mm.; after 8 days 160/100 mm.; after 58 days 180/100 mm.; after 94 days 235/150 mm. Bilateral adrenalectomy markedly reduced this hypertension; there was a marked reduction in the wt. of the kidney and heart. M. W. G.

Hypertension in acute renal insufficiency. H. E. King (Proc. Staff Mayo Clin., 1939, **14**, 187—192).—Report of a case illustrating the rise of blood pressure in acute renal insufficiency, with fall to normal as renal function improved. A. M. G.

Hypertension and renal artery constriction in man. E. Blatt and I. H. Page (Ann. int. Med., 1939, **12**, 1690—1699).—Hypertension occurred in a man with abdominal lymphosarcoma which markedly compressed the renal vessels of both sides. C. A. K.

Vasomotor effects of blood in hypertension. B. Friedman and M. Prinzmetal (Ann. int. Med., 1939, **12**, 1617—1631).—Cross-transfusions of large vols. of whole blood between 4 cases of malignant hypertension and normal subjects produced no blood pressure changes in either group. Hypertensive plasma, from patients and experimental animals, produced no vasoconstriction in the rabbit's ear vessels, although these responded readily to plasma from a case of adrenal pheochromocytoma during a paroxysm of hypertension. Blood from the renal vein of an ischæmic dog's kidney has no pressor effect. C. A. K.

Kidney in arterial hypertension. M. Prinzmetal, B. Friedman, and D. I. Abramson (Ann. int. Med., 1939, **12**, 1604—1616).—Saline extracts of ischæmic kidneys had greater pressor effects than extracts of control kidneys from dogs with unilateral renal ischæmia. Extracts of kidneys of patients dying of hypertension were more pressor than extracts from cases with normal blood pressure. C. A. K.

Diastolic blood pressure in arterial hypertension. H. Stadie (Dtsch. Arch. klin. Med., 1939, **183**, 647—658).—The average arterial blood pressure in 142 patients with renal hypertension was 193 (systolic) and 120 mm. Hg (diastolic); the mean vals. of 256 patients with essential hypertension were 192 (systolic) and 116 mm. (diastolic). The systolic and diastolic pressures were higher in male than in female patients. A. S.

Aspects of blood pressure regulation and experimental arterial hypertension. C. Heymans (Surgery, 1938, **4**, 487—501).—A review. G. K. H.

Experimental observations on surgical treatment of hypertension. H. Goldblatt (Surgery, 1938, **4**, 483—486).—A review. G. K. H.

Gradual complete occlusion of cœliac axis, superior and inferior mesenteric arteries, with survival of animals: effects of ischæmia on blood pressure. A. Blalock and S. E. Levy (Surgery, 1939, **5**, 175—178).—Gradual complete occlusion of the cœliac axis and the superior and inferior mesenteric arteries may be produced in dogs without causing death or a permanent impairment in health. A sustained elevation in the systemic blood pressure was not obtained in these experiments nor when the main arteries to the head or extremities were occluded. G. K. H.

Essential hypertension: selection of cases and results obtained by subdiaphragmatic extensive sympathectomy. W. McK. Craig (Surgery, 1938, **4**, 502—509).—Subdiaphragmatic resection of the major, minor, and lesser splanchnic nerves, cœliac ganglion, and lumbar sympathetic ganglia is recommended in the treatment of essential hypertension. Clinical subdivisions of hypertension are described, and also various tests on the blood pressure to assess preoperatively the val. of the operation. The results were satisfactory. G. K. H.

Treatment of hypertension by negative ionisation of the air. A. L. Tchijevsky (Acta med. scand., 1939, **99**, 117—139).—Inhalation of air

containing negative ions reduces vasoconstriction and lowers the blood pressure in 80—85% of cases. In renal hypertension success was obtained in 60% of cases. The effect is lasting after a course of 15 treatments. C. A. A.

Silicon and the cholesterol arteriosclerosis of the rabbit. E. Hesse (Klin. Woch., 1939, **18**, 502—503).—Cholesterol arteriosclerosis of the rabbit is not influenced by giving ethyl silicylricinoleate or ricinoleate; 75% are cured when di-iodyl is given. E. M. J.

Arteriosclerosis and internal secretion. W. Raab (Klin. Woch., 1939, **18**, 611—616).—A review. E. M. J.

Chronic hypertensive encephalopathy. C. Davison and N. Q. Brill (Ann. int. Med., 1939, **12**, 1766—1781).—In some cases of hypertension changes in the cerebral blood vessels are more marked than elsewhere; neurological signs and symptoms predominate and death usually results from cerebral hæmorrhage. C. A. K.

Comparative study of certain methods of measuring blood pressure. J. B. Cady and J. F. Herrick (J. Lab. clin. Med., 1939, **24**, 861—865).—The pressure in the 2 femoral arteries of the dog is the same. There is a satisfactory correlation between the integrated mean blood pressure, recorded with the Hamilton hypodermic manometer, and the mean pressure, read from a standard Hg manometer. The vals. for the systolic and diastolic blood pressures observed over the posterior tibial artery by the auscultatory method did not agree with those for the opposite femoral artery recorded by the hypodermic manometer. C. J. C. B.

Secondary hypertension following evacuation of an experimental hæmo- or hydro-pericardium. A. Tournade, J. Torreilles, and G. Chardon (Compt. rend. Soc. Biol., 1939, **130**, 657—658).—The hypertension that succeeds the hypotension produced by experimental hæmo- or hydro-pericardium is of nervous origin as well as due to the secretion of adrenaline. Various other nervous effects of the ischæmia are described. P. C. W.

Effect on blood flow of decreasing the lumen of a blood vessel. F. C. Mann, J. F. Herrick, H. E. Essex, and E. J. Beldes (Surgery, 1938, **4**, 249—252).—Blood flow was measured directly and by the thermostromuhr method. The carotid artery of a dog may be constricted to a considerable degree before the blood flow is reduced significantly. The area of the lumen may be reduced by 50% without any change in blood flow, and as much as 90% before a 50% reduction in blood flow occurs. G. K. H.

Surgical shock. E. Rehn, H. von Haberer, O. Goetze, and W. Wagner (Med. Klin., 1939, **35**, 493—499).—A discussion. A. S.

Vascular spasm in bronchial asthma. F. Kuhlmann (Dtsch. med. Wschr., 1939, **65**, 833—836).—Spasm of the pulmonary vessels was roentgenologically demonstrated in cases of bronchial asthma. A. S.

Cerebral blood supply and increased cerebrospinal fluid pressure. G. Stierlen (Z. ges. exp. Med., 1939, **105**, 472—496).—No change in cerebral blood supply (stromuhr determinations on internal carotid in dogs under pernocton anæsthesia) was observed at c.s.f. pressures of 30—60 mm. Hg; blood flow is diminished at higher pressures. Lower pressures interfered with blood flow in cases of meningitis. Signs of reactive hyperæmia were observed when the c.s.f. pressure returned to normal. A. S.

Origin of dicrotic pulse wave. K. Wezler and K. Greven (Z. ges. exp. Med., 1939, **105**, 540—558).—The dicrotic pulse under various experimental conditions is explained on the basis of O. Frank's resonance theory. A. S.

Evidence of vasodilator innervation in parietal cortex of the cat. H. S. Forbes, C. F. Schmidt, and G. I. Nason (Amer. J. Physiol., 1939, **125**, 216—219).—The thermoelectric method described by Schmidt and Pierson was used to record changes in blood flow by means of a thermocouple inserted 2 or 3 mm. into the parietal cortex of cats under dial–urethane anæsthesia. Open electrodes, usually bipolar, were applied to the exposed ipsilateral facial nerve just proximal to the geniculate ganglion. The results support the thesis that true vasodilator innervation of cerebral vessels is present in mammals. M. W. G.

Vasoconstriction in the hand from a deep inspiration. M. G. Mulinos and I. Shulman (Amer. J. Physiol., 1939, **125**, 310—322).—The vascular state of the hand was studied by 5 methods: (1) the pressure plethysmograph which measures the rate of blood flow into the hand; (2) the simple plethysmograph which measures the vol. changes in the blood present in the hand; (3) skin temp.; (4) skin calorimeter as indicator of the available heat in the skin; (5) microscopic observation of the capillary tufts in the nail bed. A deep inspiration causes marked constriction of the arterioles of the forearm and hand, especially in the skin of the fingers. This vasoconstriction is reflex in character and is independent of the blood flow and blood pressure in the hand and of the temp. and moisture content of the inspired air. The constriction is exaggerated by any irritant or painful stimulus which may accompany or shortly follow the deep breath. M. W. G.

Vasomotor reactions in the hypnotic state. J. Doupe, W. R. Miller, and W. K. Keller (J. Neurol. Psychiat., 1939, **2**, 97—106).—The normal vasomotor response to painful or thermal stimuli applied to the skin is also present but less intense when the suggestion of analgesia is given during hypnosis. The state of the cutaneous blood vessels cannot be altered by hypnotic suggestion except in association with induced emotional states. K. S.

Physio-pathology of the retinal circulation. Fritz (J. belge Neurol. Psychiat., 1939, **39**, 159—189).—The technique of registration of pressures and blood flow in the retinal blood vessels is described and the normal physiological findings are correlated both to systemic levels and to abnormalities found in intracranial lesions. W. K. S.

Treatment of thrombophlebitis by novocain block of sympathetics. A. Ochsner and M. De Bakey (Surgery, 1939, **5**, 491—497).—The clinical manifestations in thrombophlebitis are due largely to the vasomotor reflex which originates in the thrombosed segment. Arteriospasm is more important than venospasm in causing the manifestations. Convalesence is shortened and symptoms may be relieved completely by blocking the sympathetic supply. G. K. H.

Blood-oxygen changes after intermittent venous occlusion. J. R. Veal and W. Mellen (Amer. Heart J., 1939, **17**, 401—405).—1 min. after release of arterial occlusion (in the arm) there is a rise of venous O_2 content resulting from increased rate of blood flow. 1 min. after release of venous occlusion the venous O_2 content falls. Thus, therapeutic benefit from the latter is not due to increased rate of blood flow. C. A. K.

Regulation of cerebral circulation. J. J. Bouckaert (J. belge Neurol. Psychiat., 1938, **38**, 903—912).—A review based mainly on the results of perfusion of the isolated head. W. K. S.

Problems of cerebral circulation. O. Pötzl (Wien. med. Wschr., 1939, **89**, 462—467).—A lecture. A. S.

***X*-Ray treatment of intermittent claudication.** W. Raab (Med. Klin., 1939, **35**, 569—572).—*X*-Irradiation of the adrenal glands and of the lumbosecral sympathetic chain relieved the symptoms of intermittent claudication in 16 out of 27 patients. A. S.

Stabilisation of systolic blood pressure in supine posture. E. Ogden, N. Shock, and K. Heck (Quart. J. Exp. Physiol., 1938, **28**, 341—348).—Systolic blood pressure in young male adults falls to a const. val. of 5 mm. Hg below the initial val. during 20 min. after assuming a supine posture. Experiments in which manipulation, nervousness, and rest following activity were controlled suggested that none of these factors was the cause of the fall. Diastolic pressure showed a slight rise which was not statistically significant. T. S. G. J.

Microscopic study of embolism in the frog. E. Curtillet and A. Curtillet (Compt. rend. Soc. Biol., 1939, **130**, 645—646).—Examination of the mesentery, lungs, intestine, and web of the foot in the frog following the introduction of 0·05 c.c. of air into the ventricle shows that the air bubbles are halted in the arterioles and are there absorbed. Only bubbles so small that they can pass through the capillaries without deformation do so pass. P. C. W.

Microscopic study of resorption of air emboli in the rabbit. E. Curtillet and A. Curtillet (Compt. rend. Soc. Biol., 1939, **130**, 647—649).—Examination of the blood vessels of the ear in the rabbit following injection of air into the carotid artery shows that the air bubbles are resorbed in the arterioles and do not pass through the capillaries. P. C. W.

Rôle of arterio-venous anastomoses in air emboli. A. Curtillet and E. Curtillet (Compt. rend. Soc. Biol., 1939, **130**, 650—652).—Injection of air into the arteries of the rabbit and dog shows that the bubbles pass through the capillaries in the skin and musculature but not through those in the viscera. This is attributed to the presence of arteriovenous anastomoses in the skin and muscles since the bubbles can pass only through vessels of at least 30 μ. diameter. P. C. W.

Simple method for determining systolic blood pressure of unanæsthetised rat. J. R. Williams, jun., T. R. Harrison, and A. Grollman (J. clin. Invest., 1939, **18**, 373—376).—A method is described for determining the systolic blood pressure in the tail of the intact unanæsthetised rat, which when suitably modified as to size, can be used on other animals. C. J. C. B.

Effects of spinal anæsthesia on the circulation in normal, unoperated man; autonomy of renal arterioles. H. W. Smith, E. A. Rovenstine, W. Goldring, H. Chasis, and H. A. Ranges (J. clin. Invest., 1939, **18**, 319—341).—In 18 normals, anæsthesia was established up to the level of T 5 and in 3 up to T 1. There was no renal hyperæmia or other const. effect on the renal circulation. Normal blood pressure may be maintained; in patients in whom the arterial pressure is reduced, the systolic pressure alone falls. The peripheral vasomotor system in man under spinal anæsthesia is resistant to hypercapnia and anoxæmia, which precipitate circulatory collapse in the anæsthetised sympathectomised dog or cat. C. J. C. B.

Fixation of the skin and jugular vein with a towel clip to facilitate venipuncture. J. S. Lundy (Proc. Staff Mayo Clin., 1939, **14**, 235).—An illustrated description of the method. A. M. G.

Effect of sleep on skin temperature reactions in a case of acrocyanosis. R. Day and W. O. Klingman (J. clin. Invest., 1939, **18**, 271—276).—In a girl aged 6½ with acrocyanosis, when asleep, the hands and feet became red and warm and then responded like the rest of the body to warm and cold foot baths. Local cooling of the palm of the hand did not induce vasoconstriction when she was asleep; microscopic observation of the capillaries at the base of the nails showed sluggish flow of blood and dilatation of the venous side. C. J. C. B.

Polyarterisis nodosa. D. R. Weir (Amer. J. Path., 1939, **15**, 79—88).—Case report with autopsy. (6 photomicrographs.) C. J. C. B.

Depressor action of rabbit's blood. K. Fuzii (Tohoku J. exp. Med., 1939, **35**, 384—388).—Freshly defibrinated blood of rabbits was injected intravenously into a cat. A first brief and second prolonged fall of blood pressure occurs. Hæmolysed blood and serum cause only the first, washed corpuscles only the second, fall of pressure. The results are unaffected by adrenalectomy, section of splanchnic nerves or vagi, removal of spleen, ligature of liver arteries and portal vein, or injection of atropine. E. R.

Action of *X*-rays on lymph formation in dogs. J. Granatowicz (Wien. Arch. inn. Med., 1938, **32**, 261—272).—*X*-Irradiation of the lower limbs in dogs with thoracic duct fistulæ diminished the

secretion of lymph; the secretion was increased after radiation of the abdomen. A. S.

(vii) RESPIRATION AND BLOOD GASES.

Adaptation in diseases of the respiratory tract. G. Liebermeister (Dtsch. med. Wschr., 1939, **65**, 673—676).—A review. A. S.

Effect of respiratory resistance, during rest or manual work, on the reaction time and differentiation of light intensity. G. Ferraloro and A. M. di Giorgio (Boll. Soc. ital. Biol. sperim., 1939, **14**, 171—173; cf. A., 1939, III, 125).—The responses of men at rest are similar to those of men at work. F. O. H.

Pneumotachograms in different postures. J. Weber (Z. ges. exp. Med., 1939, **105**, 363—369).—The pneumotachograms (Hochrein's apparatus), obtained in recumbent, sitting, or standing position, showed identical shape. A. S.

Vital capacity of senior middle school and college students [in China]. C. Tsai and C. H. Wu (Chinese J. Physiol., 1939, **14**, 95—116).—4000 subjects aged from 15 upwards were studied; similar results were obtained from different parts of China. The wt. and vital capacity (V.C.) of males increased up to 25; V.C. and height were then stationary; the V.C. increased more rapidly than the other measurements. It correlated best with surface area and chest girth (2380 and 46·5 c.c. per sq. in. and per cm. respectively for adults). In females, no measurements increased after 18; the V.C. was relatively less than in the male and correlated with wt. and surface area only before 18, and with height only after 18 (16 c.c. per cm.). N. H.

Clinical examination of pulmonary function by the step method. B. Malamos (Klin. Woch., 1939, **18**, 468—470).—A clinical method is described for the spirographic determination of pulmonary function during effort, using an electrical ergograph. E. M. J.

Pulmonary changes in man due to *X*-ray treatment. H. Voegt (Virchow's Archiv, 1938, **302**, 468—496).—*X*-Ray treatment of a case of operated carcinoma of the mammary gland and of a case of mediastinal lymphogranuloma caused fibrosis of the lung tissue in the irradiated regions. H. W. K.

Resuscitation of the apparently dead. A. M. Kerven and J. Liard (J. Physiol. Path. gén., 1939, **37**, 129—140).—Mainly a review with a record of experiments on guinea-pigs and dogs. C. A. A.

Hearing capacity during respiratory resistance. G. Ferraloro and G. Torrini (Boll. Soc. ital. Biol. sperim., 1939, **14**, 173—176).—The hearing capacity of men is diminished during respiratory resistance (cf. A., 1939, III, 125). F. O. H.

Respiratory insufficiency in bronchial asthma. W. Wolf (Dtsch. Arch. klin. Med., 1939, **184**, 100—113).—The respiratory insufficiency of asthmatics was tested with Knipping's apparatus and the electrical ergometer. The decreased vital capacity produced a diminution of arterial O_2 tension in exercise. A. S.

Asthma and hay fever. S. M. Feinberg and T. B. Bernstein (J. Allergy, 1939, **10**, 283—307).—Crit. review of the literature for 1938. C. J. C. B.

Discussion on status asthmaticus. H. L. Huber, I. S. Kahn, C. K. Maytum, B. Ratner, and G. Piness (J. Allergy, 1939, **10**, 261—282). C. J. C. B.

Controlled insulin shock treatment of asthmatic children. H. Vollmer (Arch. Pediat., 1939, **56**, 223—239).—7 asthmatic children were temporarily benefited by a course of 15—25 injections of insulin. Severe shock symptoms were controlled by regulating the insulin dose, or by the administration of small sugar doses at the onset of shock symptoms. C. J. C. B.

Influence of oxygen and carbon dioxide on blood of normal and pneumonic dogs. D. J. Cohn, A. Tannenbaum, W. Thalhimer, and A. B. Hastings (J. Biol. Chem., 1939, **128**, 109—135).—In dogs in which an experimental broncho-pneumonia was produced by the intrabronchial injection of HCl (1%), no change was observed in the acid–base balance of the arterial blood, but anoxæmia was present. O_2-enriched atm. increased the O_2 saturation of the arterial blood of normal dogs slightly and that of pneumonic dogs greatly without alteration in the acid–base balance. Addition of CO_2 to the inspired air caused a slight increase in the O_2 saturation of the arterial blood of both normal and pneumonic dogs and a change in the acid–base balance indicative of respiratory acidosis, the latter being more severe in the pneumonic than in the normal dogs. The breathing of O_2-enriched air containing CO_2 resulted in both increased oxygenation of the blood and respiratory acidosis, the latter being again greater in pneumonic than in normal dogs. Both normal and pneumonic dogs, kept in the CO_2-rich atm., showed a change in their acid–base balance indicative of physiological compensation. W. O. K.

Perfused lungs of dog, guinea-pig, and *Macacus rhesus*. I. de B. Daly (Quart. J. Exp. Physiol., 1938, **28**, 357—403).—Methods are described for the perfusion of the isolated lungs of the guinea-pig and *M. rhesus* with the animal's own defibrinated blood. Defibrinated blood of the guinea-pig and dog but not of the monkey contains bronchoconstrictor substances. The bronchoconstriction in the guinea-pig is overcome by ergotoxine and adrenaline in concn. of 10^{-4}. The pressor effect on the pulmonary vessels of the dog of perfused defibrinated blood is diminished, suppressed, or reversed by ergotoxine. Neither of these effects was demonstrated in the monkey. The liability of guinea-pig lungs to bronchoconstriction detracts from their val. as preps. for physiological investigation. The lungs of the monkey remain in good condition for several hr. The hæmodynamic properties of the pulmonary vascular system of the dog and the monkey suggest that the former is better fitted for the performance of severe muscular work than the latter. The resistance of the communicating blood vessels between the bronchial and pulmonary vascular bed is less in the guinea-pig than in the dog. Three types of spontaneous lung movements are described and it is suggested that they depend on the

properties of the perfusate and the region perfused. In the monkey, adrenaline causes a rise in pulmonary arterial pressure, an initial increase in venous flow, and sometimes bronchoconstriction. Ergotoxine suppresses and sometimes reverses the action of adrenaline. Acetylcholine causes bronchoconstriction, which is potentiated by eserine and abolished by atropine. Small doses lower and larger doses raise the pulmonary arterial pressure; the latter effect is suppressed or reversed by adrenaline. Indirect measurements of the vol. of blood contained in the pulmonary capillaries of the dog during perfusion at high flow under negative pressure ventilation show that it represents 6% of the total blood vol. of the body. An appendix analyses the perfusion technique, and methods are described for the avoidance of mechanical artifacts. T. S. G. J.

Physiological changes in high altitudes. R. Stigler (Wien. med. Wschr., 1939, **89**, 507—511).—A review. A. S.

Sensitivity of different species to high oxygen concentrations. P. Soulié (Compt. rend. Soc. Biol., 1939, **130**, 539—541).—Various laboratory mammals and birds were exposed to an atm. containing 90% O_2. There was little difference in the survival time of the various species (2—5 days), although certain individuals in each group exhibited exceptional resistance. P. C. W.

Increasing resistance of rats to toxic effects of oxygen. P. Soulié (Compt. rend. Soc. Biol., 1939, **130**, 541—542).—Intermittent prolonged inhalation of O_2 until pulmonary lesions develop, or inhalation of diphosgene in non-fatal concns., increases the resistance of the white rat to chronic O_2 intoxication. P. C. W.

Chemical irritants in tense pneumothorax. H. Hennell and M. F. Steinberg (Arch. intern. Med., 1939, **63**, 648—663).—Iodised oil and conc. glucose solution were successfully used by intrapleural injection in 5 out of 6 cases of chronic tense (valvular) pneumothorax. C. A. K.

Biological oxidations and anoxæmia. E. S. G. Barrón (Bol. Soc. Quím. Peru, 1938, **4**, 253—266).—A survey of the literature dealing with the influence of changes in O_2 pressure on man. F. R. G.

(viii) MUSCLE.

New dynamometer. W. Birkmayer (Klin. Woch., 1939, **18**, 390). E. M. J.

Contractility and double refraction in rubber and muscle. U. Ebbecke (Pflüger's Archiv, 1938, **240**, 458—476).—Slightly vulcanised rubber becomes increasingly birefringent if subjected to increasing tension. At the same time fibrillar structure develops. Increase in length and contractility outlasts a sudden pull when the rubber strip is now exposed to the previous load. When an extended rubber strip contracts under the influence of heat the double refraction decreases a little under isotonic, and just perceptibly under isometric, conditions, and approaches the original val. again after cooling to room temp., more perfectly if the length is kept const., the tension facilitating the re-formation of structure. These changes are intensified after prep. by a sudden pull, the strip finally returning to its optical appearance before pulling. It is suggested that the phenomena are due to orientation of giant thread mols. by tension and their disorientation by heat. Contraction and double refraction of muscle are regarded as essentially similar. H. Ro.

Repetitive discharges and inhibitory after-effect in post-tetanically facilitated responses of cat muscles to single nerve volleys. T. P. Feng, T. H. Li, and Y. C. Ting (Chinese J. Physiol., 1939, **14**, 55—80).—Oscillograph records were made of the electrical responses to nerve stimulation of 3 muscles of the decerebrate cat with intact blood supply. In soleus, following a tetanus at a frequency of stimulation which caused Wedensky inhibition, single twitches showed a greater size and a double action-current, abolished by curare and exaggerated by eserine; also the 2nd of 2 twitches 25 msec. apart, and the 2nd—4th discharges of a low-frequency tetanus, were depressed, this inhibition being abolished by eserine or curare. Tibialis anticus and gastrocnemius did not show the depression unless treated with eserine, nor did they give a double discharge, nor was the facilitation of post-tetanic twitches dependent on the frequency of the preceding tetanus. N. H.

Extensibility of frog's muscle in contracture and tetanus. H. Remberg (Pflüger's Archiv, 1938, **240**, 329—341).—Length–load diagrams of the gastrocnemius were recorded with a modified Blix–Fick myograph. In contracture produced by $CHCl_3$ or pressure (800 atm.) under isotonic conditions, the stiffened muscle tends to resist both extension and shortening. Winter muscles react identically to both contracture agents, *i.e.*, remain in contracture, while the compression contracture of (damaged?) summer muscles disappears under load and returns only slowly after release. After contracture under isometric conditions the muscle shrinks and is abnormally extensible. During tetanus (25—100 shocks per sec.) the extensibility of the unfatigued muscle diminishes, but increases rapidly with onset of fatigue. Compression contracture is not attended by coagulation and resembles tetanic shortening. H. Ro.

After-effects of skeletal muscle-contraction. E. Jalavisto, L. Keränen, and I. Seppälä (Skand. Arch. Physiol., 1939, **82**, 1—28).—Action potentials of the first dorsal interosseus muscle were recorded with a concentric needle electrode and a cathode-ray tube–amplifier unit. The rate of impulses immediately following a contraction is smaller than that of the resting muscle. This phenomenon is attributed to a change in the muscle itself. The so-called Kohnstamm catatonus experiment is explained on the basis of these after-effects of muscle contraction. A. S.

Natural frequency and reversibility of volume constriction of muscle. O. Meyerhof (Pflüger's Archiv, 1938, **240**, 386—387).—A note on a paper by Ernst and Koczkas (A., 1938, III, 562). The figures for the expansion of the liquid paraffin in which the muscle was suspended during the measurement were

obtained by actual calibration and not by calculation from consts. The criticism, therefore, is ill-founded. H. Ro.

Distribution of body water in skeletal muscle in dogs with impaired renal function. L. Eichelberger (J. Biol. Chem., 1939, **128**, 137—152).—Changes in the vol. of the extra- and intra-cellular phases of the skeletal muscles of dogs in which acute uræmic, chronic non-uræmic, and progressive uræmic hydronephrosis had been produced are given. An increase in total body-water caused by the injection of isotonic salt solution containing $NaHCO_3$ produced similar changes in normal and pathological dogs except that, in the animals with progressive uræmic hydronephrosis, the total bulk of the muscle tended to increase more than in normal animals. This increase was accounted for by the increase in extracellular phase, the intracellular phase remaining const. as in the case of the experimental animals. The experiments do not suggest that œdema occurs as the result of impaired renal function. W. O. K.

Glycolysis *in vitro* of muscle of febrile animals. C. M. Valeri (Boll. Soc. ital. Biol. sperim., 1939, **14**, 125—128).—The muscle of rabbits, in which a body temp. of 1·5—2° above normal had been induced by injection of autolysed brewers' yeast, shows *in vitro* an increased (compared with non-febrile animals) initial production of lactic acid and inorg. P; after 2 hr. at 37°, production of lactic acid is increased and that of inorg. P decreased when glycogen is added and vice versa when glycogen is not added. Hence metabolic activity is enhanced in febrile muscle. F. O. H.

Amino-acids of rabbit myosin. J. G. Sharp (Biochem. J., 1939, **33**, 679—693; cf. Smith, A., 1938, III, 21).—When the basic amino-acids of the myosin are determined by Block's method (A., 1934, 1241), the dicarboxylic amino-acids by separation of Ca salts, and the monoamino-acids by fractional distillation of the ethyl esters, account is given of 72% of the N (equiv. to 77% of the wt.) of the protein. These vals. are increased to 76% and 85%, respectively, by incorporating Bailey's vals. (A., 1937, III, 375) for tyrosine, tryptophan, methionine, and cystine. The predominating amino-acids are leucine 7·1, arginine 13·4, lysine 11·3, glutamic acid 12·5, and aspartic acid 5·6%. Butyl alcohol extracts large proportions of basic and dicarboxylic amino-acids from acid-free myosin hydrolysate. By the procedure of Foreman (A., 1920, i, 338), it is possible to obtain 93% of the N of the monoamino-acids in the form of free esters sol. in $CHCl_3$. The results support the theories of Lloyd and Philips (A., 1933, 226) concerning the relationship between structure and hydration and indicate that fibrous myosin has the same fundamental folded chain structure as have the keratins. In the living muscle, myosin probably exists in the form of highly organised systems of peptide chains. W. McC.

Rôle of motor and sympathetic nerve endings in use of phosphagen by muscles during work and their interaction during resting metabolism. V. A. Musheev, T. A. Sviderskaja, and Z. I. Schitova (Arch. Sci. biol. U.R.S.S., 1937, **44**, 77—85).—In frogs the motor nerve roots of the posterior limb of one side were divided proximally to the entry of the rami communicantes; in another series the rami communicantes only, and in a 3rd series the sciatic nerve in the thigh, were cut. 4 weeks later, when nerve degeneration was complete, monoiodoacetate was introduced into the lumbar sac after division of the motor nerve roots of the other side, or of both sides (in the 2nd series). The isolated calf muscles were stimulated until fatigue set in and the remaining phosphagen was determined. The results show that a functional antagonism exists between the motor and sympathetic nerve endings in the muscles and that phosphagen is not the chief supply for energy either for contraction or for recovery in muscle. T. T.

Humoral transmission of muscular contraction in presence of veratrine. A. Szent-Györgyi, Z. M. Bacq, and M. Goffart (Nature, 1939, **143**, 522).—This effect has been demonstrated in the hind limbs of the frog; it is not due to acetylcholine. $K^{\cdot}$ is probably the substance responsible. L. S. T.

Effect of eserine on muscular work. E. Milla (Arch. Fisiol., 1939, **38**, 490—513).—See A., 1939, III, 464. Similar results were obtained with isolated frog's gastrocnemii. Resistance to fatigue was also higher, and the blood-lactic acid after exercise was lower, in human subjects given 1·5—2·5 mg. of prostigmine. S. O.

Quinine antagonism to prostigmine [on skeletal muscle]. G. Briscoe (Lancet, 1939, **236**, 1151—1152).—Given intravenously, quinine is antagonistic to prostigmine and synergistic with curarine in its effects on normal skeletal muscle (cat's quadriceps). It raises the threshold of the motor end-plates and has a direct muscular action. It is suggested that in myotonia congenita there is hyperexcitability to normal amounts of acetylcholine. C. A. K.

Nutritional muscular dystrophy in young rats. A. M. Pappenheimer (Amer. J. Path., 1939, **15**, 179—184).—The changes may be due to excessive muscular contraction with segmental rupture of fibres and subsequent necrosis by a direct selective toxic action on the muscles or by angiospastic occlusion, causing infarction. The fact that the superficial fibres of the muscle often escape is in favour of the last hypothesis. The degeneration of the fibres occurs with great suddenness; the later stages are those of reaction to necrotic tissue, and regeneration. (8 photomicrographs.) C. J. C. B.

Action of glycine in progressive muscular dystrophy. S. von Pastinszky (Münch. med. Wschr., 1939, **86**, 818—819).—Prolonged intravenous and oral administration of glycine in a case of progressive muscular dystrophy considerably improved the muscular condition and cured severe crural ulcers which previously did not respond to treatment. A. S.

Ætiology of paroxysmal paralysis. H. C. à Wengen (Klin. Woch., 1939, **18**, 602—606).—2 cases of paroxysmal paralysis are described. Intravenous injection into guinea-pigs of urine or serum obtained from these cases during the attack, of human

or ox gall bladder bile, or of a 10% aq. solution of Na taurocholate, produces a similar picture in these animals with rapid death. Intramuscular or subcutaneous injection of the taurocholate produces only temporary local paralysis; intravenous injection of serum of cases of severe enteritis or Graves' disease is innocuous. The significance of these findings for the auto-intoxication theory of this condition is discussed. E. M. J.

(ix) NERVOUS SYSTEM.

Polarised light method for study of myelin degeneration compared with Marchi and Sudan III methods. C. O. Prickett and C. Stevens (Amer. J. Path, 1939, **15**, 241—250).—The polarised light method is both rapid and accurate. Both myelin sheath and axis cylinder changes were visible in the same prep. The Marchi method gave inconsistent results and Sudan III, though consistent, failed to reveal early changes. Marked degenerative changes were shown by polarised light 24 hr. after nerve section compared with 72 hr. with the Marchi and 120 hr. with the Sudan III methods. (19 photomicrographs.) C. J. C. B.

Sensory organs in head of *Lucilia sericata*. P. Debaisieux (Ann. Soc. sci. Brux., 1939, **59**, 9—23).—The histological structure of the numerous and varied sensory end organs in the cephalic lobes is described in detail. Although the animal is negatively phototropic, it is not proved that the antennary organs are photosensitive. E. E. H.

Nature of vibratory sensibility. H. W. Newman, J. Doupe, and R. W. Wilkins (Brain, 1939, **62**, 31—40).—For applying vibratory stimuli an electromagnetic vibrator was used. Normal persons were subjected to local anæsthesia of superficial and deep structures in various areas of the body. Subjects with lesions of certain spinal tracts were examined without artificial anæsthesia. It is probable that the receptors for vibration in the skin are identical with those for touch, and the receptors for vibration in the deeper structures with those for passive movement. K. S.

Neurogenic tumours arising from the sacrum. A. W. Adson, F. P. Moerson, and J. W. Kernohan (Arch. Neurol. Psychiat., Chicago, 1939, **41**, 535—555).—33 neurogenic tumours arising from the sacral region were analysed. There were 19 chordomas, 7 ependymomas, 3 ganglioneuromas, 3 neurolipromas, and 1 teratoma. Local pain and tenderness are the common symptoms, and the signs those of a pelvis mass. The ependymoma is amenable to surgical removal but the chordoma is not. A. M. B.

Electric activity of the nervous system in the siphon of Mia. H. Pieron and J. Segal (Compt. rend. Soc. Biol., 1939, **130**, 634—637).—The nervous system consists of a diffuse ganglion and 20 nerve trunks. The type of potential changes recorded depends on the position of the electrodes in relation to these structures. Analysis of the records obtained after light, mechanical, or chemical stimuli shows that there are rapidly conducting fibres in the trunks. P. C. W.

Character of local electric response in the isolated axon of *Sepia*. A. Arvanitaki (Compt. rend. Soc. Biol., 1939, **130**, 545—548).—25% of the axons show a diphasic response to the passage of a const. subliminal current. If the axon is decalcified by the local application of a Na oxalate solution the diphasic response becomes marked in all cases and there may be 3—4 waves of decreasing amplitude. The currect intensity necessary to produce a wave response of the same amplitude is decreased. With supra-rheobasic currents under these conditions the amplitude of the wave may be so great as to give rise to a rhythmic response. P. C. W.

Action of alternating currents on the electrical excitability of nerve. J. Reboul and A. Rosenblueth (Amer. J. Physiol., 1939, **125**, 205—215).—Cats under dial anæsthesia were used. Observations were made recording the contractions of the gastrocnemius–soleus muscle as indicators of the responses of the popliteal nerve to the test stimuli delivered; the spike potentials of the A fibres of the excised peroneal nerve were also used. Applications of weak a.c. to a nerve decrease locally the electrical excitability. Stronger currents lead to increased excitability which may be followed by a delayed decrease. The effects are max. at the poles and decrease with the distance from these poles. The data obtained indicate that a.c. exerts two independent opposite effects on excitability. M. W. G.

Blocking and deblocking effects of alternating currents on nerve. A. Rosenblueth and J. Reboul (Amer. J. Physiol., 1939, **125**, 251—264; see preceding abstract).—Nerve impulses may be blocked after application of a.c., the block depending on the intensity, frequency, duration, and inter-electrodal distance. Repeated application of a.c. leads to increasing block. A.c. has a deblocking action demonstrable after some fibres have been blocked; this effect is not due to a subsidence of the previous block. The effect of a.c. at any time is the resultant of the blocking and deblocking actions. M. W. G.

Influence of excitation of nerve fibre on excitability of nearby fibres in same nerve trunk. T. Otanl (Coll. Papers to Prof. Isikawa, Kyoto, 1938, 282—297).—Centripetal stimulation of the tibial or peroneal nerve of the toad was followed at varying intervals by submax. stimulation of the sciatic, and observation of the height of twitch of the gastrocnemius muscle. This twitch decreased when the sciatic stimulation was simultaneous or 10 msec. after arrival of the centripetal stimulus, and increased when 200 msec. after arrival at the point of sciatic stimulation. W. Bu.

Electric stimulation and the excitatory process in the nerve fibre. I. Tasaki (Amer. J. Physiol., 1939, **125**, 380—395).—By the method of tri-polar stimulation, the mechanism of electric excitation of nerve fibre was studied (motor nerve of Japanese toad). The plasma membrane at the node of Ranvier (coaxial with the axis) is the site of Nernst's polarisation. The myelin sheath is practically a perfect insulator. The excitatory state is produced by the outwardly-directed potential drop across the plasma

membrane at the node. When a p.d. is applied to a fibre between two neighbouring nodes of Ranvier, excitatory states are produced all along the fibre. Spread of the stimulating current in the nerve trunk is explained on a physical structural basis. The strength–duration curve varies with the distribution of potential along the nerve fibre. Variability of the resistance through the plasma membrane accounts for this fact. The dependence of the chronaxie on the size of the electrode and its allied phenomena are explained from this viewpoint. M. W. G.

Strength–duration relation of normal, polarised, and narcotised nerve fibre. I. Tasaki (Amer. J. Physiol., 1939, **125**, 367—379).—A modification of Shimizu and Kaku's method for isolating a single nerve fibre is described. A method is given for stimulating an isolated myelinated fibre by insulating the internode. The strength–duration relations were determined on normal, narcotised, and polarised nerve fibre of the toad. All results were in good accord with Weiss' formula. In the normal nerve fibre, at 10—15°, the chronaxie was 0·3—0·5 msec., and the rheobase was 25—50 mv. At the same point on the nerve trunk of a motor-unit prep., the strength–duration relation was determined before and after removal of the connective tissue sheath. The chronaxie in the sheathless nerve was half that in the intact nerve. This effect of the sheath is attributed to the decrease in potential gradient along the nerve fibre inside. M. W. G.

Toxic origin of paralysis in the Guillain–Barré syndrome. Heernu (J. belge Neurol. Psychiat., 1939, **39**, 250—254).—A close resemblance is noted between the Guillain–Barré syndrome and polyneuritis of diphtheritic origin. W. K. S.

Effects of ligations on nerves of the extremities. F. M. Allen (Ann. Surg., 1938, **108**, 1088—1093).—Nerve lesions resulting from ligation of limbs may be caused either by direct pressure of the tourniquet or by asphyxia. Experiments on rats and rabbits suggest that permanent paralyses arise only from the former cause. Wide pressure is probably more injurious than a narrow band. The duration of the nerve paralyses increases in proportion to the time of ligation. G. K. H.

Electro-physiological study of postural regulation. P. Mollaret (Rev. Neurol., 1939, **71**, 257—266).—Variations in chronaxie of antagonistic muscles due to segmental postural changes of a limb were determined experimentally in normal dogs under conditions which excluded all external influences and fatigue. The relationship of the observations to the inversion of the plantar response in hemiplegia is adduced. W. K. S.

Chemical agent in nerves; acetylaneurin. R. Kuhn, T. Wieland, and H. Huebschmann (Z. physiol. Chem., 1939, **259**, 48—52).—A 45% yield of acetylaneurin (cf. Bergel and Todd, A., 1938, II, 116) is obtained by condensation of 4-amino-2-methyl-5-bromomethylpyrimidine dihydrobromide with 4-methyl-5-acetoxyethylthiazole. In contrast to aneurin, acetylaneurin has an action on surviving rat intestine which is almost identical with that of acetylcholine. 10 μg. of acetylaneurin per 50 c.c. of solution can be detected. J. N. A.

Acetylcholine content of various nerve trunks and its synthesis *in vitro*. H. C. Chang, W. M. Hsieh, L. Y. Lee, T. H. Li, and R. K. S. Lim (Chinese J. Physiol., 1939, **14**, 27—38).—Acetylcholine was determined on the eserinised leech, and toad's rectus and heart; it was extracted from nerves of the sheep, dog, cow, or toad by alcohol or trichloroacetic acid, salts and fat being removed if large amounts of tissue were used. 37° was the optimal temp. for synthesis of acetylcholine by dog's nerve in eserine–saline. Choline-esterase was estimated by finding the amount of acethylcholine hydrolysed by chopped nerve. Motor nerves contain more acetylcholine and choline-esterase than sensory, and preganglionic splanchnic fibres more acetylcholine than postganglionic. N. H.

Liberation of acetylcholine from nerve trunks during stimulation. H. C. Chang, W. M. Hsieh, T. H. Li, and R. K. S. Lim (Chinese J. Physiol., 1939, **14**, 19—26).—Acetylcholine was determined on the rectus abdominis of the toad and leech. Heating increased the amount of acetylcholine liberated from dog's isolated mixed or motor nerve in saline containing 0·1 mg. of eserine per c.c., leaving none extractable by alcohol. Electrical stimulation increased the saline-extractable acetylcholine; previous incubation for 2 hr. at 37° increased the acetylcholine liberated on stimulation and also the alcohol-extractable acetylcholine, showing that synthesis occurred. Acetylcholine was liberated into eserine–saline from toad's nerve stimulated *in situ*. N. H.

Spastic dysphonia ("inspiratory speech"). M. Critchley (Brain, 1939, **62**, 96—103).—A patient with torticollis spastica showed a hoarse and jerky speech, with breathless and constrained sounds and imperfectly pronounced vowels. The speech was expiratory and the diaphragm moved normally during speech, as demonstrated by *X*-rays. K. S.

Size of human nerve cells at different ages. L. Pilati (Arch. Sci. biol., Napoli, 1938, **24**, 229—238).—With increasing age (up to at least 80 years) the mean diameter of human dorsal root ganglion cells increases; so also does the variation from this mean. (Cf. A., 1939, III, 245.) R. S. Cr.

Structural differences in spinal ganglion of man. G. Andreassi (Boll. Soc. ital. Biol. sperim., 1939, **14**, 128—130).—Observations of density of distribution and size are recorded. F. O. H.

Unmyelinated nerve fibres in posterior spinal roots. G. Dahlstrom and A. Swensson (Anat. Anz., 1939, **87**, 360—364).—Counts of the fibres in the posterior root of L2 of the macaque made from one batch of sections stained with Ag and another batch from the same root stained by the Alzheimer–Mann method for myelin and neuroglia show the occurrence of 20% of myelin-free fibres scattered irregularly through the root. J. H. G.

Peripheral regulation in the dog with spinal cord destroyed. IV. Function of the rectum, bladder, and their sphincters. H. Hermann,

G. Morin, and J. Vial (Arch. int. Physiol., 1939, **48**, 102—122).—After destruction of the spinal cord in the thoracic, lumbar, and sacral regions, the rectum and its sphincters retained their tone and motility, fæces being expelled slowly at intervals. Spontaneous micturition did not occur, urine escaping drop by drop from the distended bladder. W. Bu.

Course of recovery of the spinal cord from asphyxia. A. van Harreveld and G. Marmont (J. Neurophysiol., 1939, **2**, 101—111).—The intra-dural pressure of spinal cats was raised above the arterial blood pressure for 25—75 min., causing asphyxia in the cord. The hind limb reflexes were studied during the asphyxia and for 3 weeks afterwards. The cord showed, after 14 days, a reduced no. of anterior horn cells, varying with the duration of the asphyxia. The reflexes returned after all durations of asphyxia but disappeared again after long durations; they were intense after medium and moderate after short durations. The increased reflex excitability and the exaggerated tone are the result of release, the normal inhibiting systems of the cord being more damaged by asphyxia than the excitatory systems. S. Cr.

Accessory respiratory tract in anterior columns of spinal cord. E. Tosatti (Arch. Fisiol., 1939, **38**, 533—564).—A detailed account of work already noted (A., 1939, III, 466). S. O.

Systemisation and central connexions of spinal tract and nucleus of the trigeminal nerve. G. E. Smyth (Brain, 1939, **62**, 41—87).—A crit. review of the literature and clinico-anatomical study of 3 cases shows that the representation of the trigeminal areas in the spinal tract has a segmental arrangement opposite to the peripheral one. The theory of a concentric arrangement around the tip of the nose cannot be maintained. There is no dorsal quinto-thalamic tract in man; the quinto-thalamic tract forms part of the medial lemniscus. Superficial and deep pain and thermal sensibility are conveyed exclusively by the spinal tract of the trigeminal nerve. Sensation of touch and discrimination are related to the main sensory nucleus of the 5th nerve. K. S.

Differences between experimental rigidities in cats. E. G. T. Liddell (Brain, 1938, **61**, 402—409).—Lesions of the dorsolateral area of the cord, immediately adjoining the dorsal horn in a ventral direction, produced rigidity in the ipsilateral limb. The difference between this phenomenon and decerebrate rigidity is pointed out in detail. K. S.

Spinal hydatidosis. O. Luque and C. B. Caraffa (Arch. argent. Neurol., 1939, **20**, 12—35).—8 cases of hydatid cysts of the cord are described, all confirmed by operation or post-mortem examination. The Wimberg-Gedini and Cassone reactions and eosinophilia were negative in 7 of the 8 cases. W. W.

Acute hæmatoporphyrinuria [with Landry's paralysis]. J. Geissler (Klin. Woch., 1939, **18**, 378—380).—A case is described of acute hæmatoporphyrinuria which ended fatally with the appearance of an ascending (Landry's) paralysis. The spinal cord showed cellular degeneration diminishing from below upwards. E. M. J.

Afferent fibres of the hypoglossal nerve. C. B. B. Downman (J. Anat., Lond., 1939, **73**, 387—395).—Afferent fibres are present (cat) in the hypoglossal, descendens hypoglossi, and descendens cervicalis nerves, since stimulation causes reflex pupil dilatation and rise of blood pressure. The cells of origin of these afferent fibres were not located, but the peripheral endings are probably in close relation to the tongue muscles. E. E. H.

Idiopathic cerebral polyneuritis. I. Glavan (Arch. Psychiat. Nervenkr., 1938, **108**, 668—679).—During an epidemic of influenza and after exposure of the head to wet cold a patient suffered from bilateral lesions of the 3rd, 4th, 5th, 6th, 7th, 8th, 9th, and 11th nerves with hyperalbuminosis and pleocytosis in the c.s.f. There were no other symptoms in the nervous system or body. K. S.

Electrical studies on the pharmacology of autonomic synapses. II. Action of a sympathomimetic drug (epinephrine) on sympathetic ganglia. A. S. Marrazzi (J. Pharm. Exp. Ther., 1939, **65**, 395—404; cf. A., 1939, III, 308).—Adrenaline inhibits the response of the superior cervical ganglion to stimulation of the preganglionic nerve. Mechanically produced anæmia causes no alteration in response. The ganglionic action of adrenaline is independent of its associated vascular effects. E. M. S.

Effects of preganglionic denervation on the superior cervical ganglion. A. Rosenblueth and W. B. Cannon (Amer. J. Physiol., 1939, **125**, 276—289).—Cats under dial were used; the cervical sympathetic on one side was cut 9—25 days before the observations. The adrenal glands were ligated and the intact cervical sympathetic was cut. Isotonic contractions of both nictitating membranes were recorded under various conditions. By intravenous injections of acetylcholine after atropine and curare, or local applications of acetylcholine solutions to the ganglia without any drugs, the previously reported increased sensitivity of the ganglion on the denervated side was fully confirmed. By injection of acetylcholine into the common carotids after ligation of the external carotids, it was readily possible to differentiate the effects on the ganglion from the direct effects on the membrane. The denervated ganglion was 4 times as sensitive as the normal control ganglion, as measured by threshold doses. The results of T. R. Elliott on increased sensitivity of the membrane to adrenaline after chronic preganglionic denervation were confirmed. M. W. G.

Excitability states of inferior mesenteric ganglion cells following preganglionic activation. D. P. C. Lloyd (J. Physiol., 1939, **95**, 464—475).—A subliminal fringe cannot be demonstrated in the S_2 ganglion cell pool of the inferior mesenteric ganglia (decerebrated cat), but the phase of increasing inhibition (submerged facilitation) indicates the presence of a period of supernormality lasting 100 msec. The response to a testing volley may be inhibited by 20—25% at the optimal interval or may show no inhibition.

The const. degree of inhibition in any one ganglion over a range of stimulation strengths indicates that the impulses from a preganglionic fibre are for the most part individually supramax. for the cells supplied by that fibre. Supernormality and subnormality are fundamental reactions of the ganglion cell. Facilitation and inhibition, though based on these reactions, are primarily functions of the relationship between preganglionic fibres and ganglion cells, as is the absence of facilitation and inhibition. J. A. C.

Nerve-cells in trunk of rabbit vagus nerve. R. S. Gorodinskaja (Arch. Sci. biol. U.R.S.S., 1937, **44**, 5—29).—Two types of cells differing in Nissl granules were found along the trunk of the vagi: one corresponding with the cerebrospinal sensory cells and another resembling the sympathetic cells of the upper cervical ganglion. Occasionally a third type of cell is met with, in which the Nissl substance forms bands around the nucleus. The size of the cells varies from 100×18 μ. to 10×8. There are relatively few cells in the cervical part of the trunk, more in the abdominal and most in the thoracic part. T. T.

Cœliac ganglionectomy and plexus resection for tabetic gastric crises. F. L. Pearl (Ann. Surg., 1939, **109**, 263—266).—In one case, intractable gastric crises of tabetic origin were relieved following excision of the cœliac plexus and ganglia. G. K. H.

Problem of neurosis. H. Löfvendahl (Acta med. scand., 1939, **99**, 28—44).—A discussion. Derangement of some part of the vegetative nervous system is usually responsible for neuroses. C. A. A.

Hypothalamus and gastric motility. T. S. Heslop (Quart. J. Exp. Physiol., 1938, **28**, 335—339).—The hypothalamus was stimulated by thyratron discharge in cats under chloralose anæsthesia; localisation was effected with the Souttar machine. Stimulation of the supra-optic nuclei produced a marked increase in gastric tone and motility, observed radiographically and compared with controls subjected to simple penetration by the electrode. Such effects persisted for a considerable time after stimulation. Posterior hypothalamic stimulation produced a transient relaxation of the pyloric end of the stomach. T. S. G. J.

Nature of bladder responses following stimulation of anterior hypothalamus. S. C. Wang and F. Harrison (Amer. J. Physiol., 1939, **125**, 301—309).—In cats under nembutal, records of bladder responses were obtained by a urethral cannula connected to a tambour recording system. A bipolar nichrome-wire electrode (insulated and tips 0·3 mm. apart) was introduced into the anterior hypothalamus and left undisturbed when a reactive region was located. The point of stimulation was in the lateral hypothalamic area rostral to the infundibulum. The bladder response following stimulation of the anterior hypothalamus is mediated through the sacral autonomic as well as the hypogastric nerves. Stimulation of the *S*II and *S*III roots or the hypogastric nerve leads to contraction of the bladder. These responses are all resistant to atropine. The bladder response to stimulation of the anterior hypothalamus is inhibited by ergotamine, but the action of the latter does not appear to be peripheral. M. W. G.

Structure of hypothalamus. G. M. Griffiths (J. Neurol. Psychiat., 1939, **2**, 154—164).—A crit. review. K. S.

Autonomic functions of the cerebral cortex. R. L. Crouch and J. K. Thompson (J. nerv. ment. Dis., 1939, **89**, 328—334).—In cats, dogs, and monkeys, the cortex was exposed and stimulated electrically. The experiments were performed either under general anæsthesia (barbiturates) or under local anæsthesia combined with the application of curare. Various changes in size of pupil, blood pressure and heart rate, flow of saliva, defæcation, and micturition were obtained from points in the motor and premotor regions. There were no definite cortical points from which certain limited reactions could be elicited. There were no separate foci for sympathetic and parasympathetic functions; it depended on the state of the animal at the time of the experiment whether a sympathetic or a parasympathetic response occurred. K. S.

Encephalitis lethargica of vegetative centres. A. Gordon (Rev. Neurol., 1939, **71**, 411—416).—Encephalitis lethargica was postulated as the cause of the periodic recrudescence of a triad of symptoms: somnolence, polyphagia, and polydipsia. Report of 2 cases. W. K. S.

Autonomic imbalance in hemiplegia. D. Paulian, I. Bistriceanu, and C. Fortunescu (Arch. Neurol. Bucarest, 1939, **3**, 68—70).—Differences in blood pressure, sweating, dermographia, and pilomotor response were observed between the normal and abnormal sides in both flaccid and spastic hemiplegias. W. K. S.

Formation of immune substances as a function of vegetative nervous system. S. Belák (Klin. Woch., 1939, **18**, 472—474).—A review. E. M. J.

Cerebellar part of pyramidal tract. K. Schaffer (Z. ges. Anat., Z. Anat. Entw. Gesch., 1938, **109**, 278—281).—The pyramidal tract consists of motor fibres and fibres controlling tonus. In the medulla the fibres controlling tonus pass through the arcuate fasciculus. W. B.

Presence of synarmotical cell in cerebellum of birds. H. Lowenberg (Amer. J. phys. Anthrop., 1939, **24**, 273—280).—Special multipolar cell elements of the kind already observed in the cerebellum of certain mammals and known as "synarmotical cells" (Landau) are described in the white layer of the central lobe of the anterior vermis of birds. They probably represent the smallest association elements in the cerebellum connecting two cortical segments of the same lamina. W. F. H.

Glioma of pons: clinical and pathological characteristics. B. J. Alpers and J. C. Yaskin (Arch. Neurol. Psychiat., Chicago, 1939, **41**, 431—459).—11 cases of pontine glioma are analysed in detail. This type of tumour occurs most commonly, though not exclusively, in children. The clinical course is progressive, ending fatally within about 3

months. The physical signs most commonly observed are, in order of frequency, abducens palsy, facial palsy, absent corneal reflexes, those of pyramidal involvement, and those of cerebellar involvement. Cranial nerves viii, x, and xii are involved rather less often. Papillœdema is very uncommon.

A. M. B.

Anatomical functions of external geniculate body in man. M. Balado (Arch. argent. Neurol., 1938, **19**, 5—41).—The literature is reviewed with illustrative photomicrographs. Evidence is given against bilateral macular representation by way of the corpus callosum. A case is reported of metastatic lesion of the striate visual cortex involving only area 4a, causing an incongruous hemianopia; it is suggested that 4a receives impulses from the homolateral eye and that 4c receives those from the contralateral eye. The giant cells of the ventral portion of the external geniculate body send fibres concerned with the light reflex to the anterior quadrigeminal bodies by way of the posterior commissure.

W. W.

Oscillographic registration of ocular movements and nystagmus. R. Jung (Klin. Woch., 1939, **18**, 21—24).—A method is described for the simultaneous but independent registration of the vertical and horizontal components of normal and abnormal ocular movements. E. M. J.

Nucleus of the oculomotor nerve with special reference to innervation of the pupil and fibres from the pretectal region. J. W. Benjamin (J. nerv. ment. Dis., 1938, **89**, 294—310).—In 21 cats the anterior part of the midbrain was stimulated and damaged by means of the Horsley-Clarke stereotaxic instrument, and the results controlled by serial sections. The Edinger–Westphal nucleus and the caudoventrally arching fibres of the posterior commissure were related to the constrictor reflexes. The anterior median small cell group of the oculo-motor nucleus may be connected with constriction of the pupil. The large cells in the caudal third have nothing to do with pupillary constriction. K. S.

Cortical projection of the medial geniculate body. H. H. Woollard and A. Harpman (J. Neurol. Psychiat., 1939, **2**, 35—44).—In 2 cats lesions of the medial geniculate body were produced by Horsley-Clarke's stereotaxic instrument and the tract degeneration traced in Marchi series. The medial geniculate body projects on to a cortical area which is limited by the anterior and posterior ectosylvian fissure, the suprasylvian fissure, and a borderline near the rhinal fissure. In the same experiments lesions of the cuneate nucleus were produced; the resulting tract degeneration could be traced in the more medial part of the pars externa of the nucleus ventralis thalami.

K. S.

Systematic arrangements of fibres in the internal capsule, thalamus, and pes pedunculi. J. D. Fortuyn (Proc. K. Akad. Wetensch. Amsterdam, 1938, **41**, 1146—1155).—The patterns of cortex, internal capsule, thalamus, and peduncles are similar. The fibres of the frontal, sensory, motor, and parietal areas are surrounded by the corpus striatum and terminate in the thalamic nuclei; the fibres of the occipital, temporal, and adjacent parietal cortical areas run retro-lenticularly to the metathalamus and to the posterior part of the lateral nucleus. Fronto-occipital arrangement in the cortex corresponds with mesial lateral arrangement in the thalamus; fibres from adjacent parts of the cortex end in adjacent parts of the thalamus. The arrangement of the fibres in the pes pedunculi is from mesial to lateral: frontal lobe, pre-central cortex, post-central cortex, parietal cortex, temporal and occipital cortex fibres.

A. S.

Extrapyramidal system: experimental demonstration of function. F. A. Mettler, H. W. Ades, E. Lipman, and E. A. Culler (Arch. Neurol. Psychiat., Chicago, 1939, **41**, 984—995).—In cats and monkeys, stimulation of the caudate nucleus, putamen, or claustrum inhibits movements induced by cortical stimulation. Stimulation of globus pallidus gives a degree of plastic tonus to cortically induced movements and prolongs their relaxation time. Stimulation of the substantia nigra increases extensor tonus and adds tremor to these movements. All the above effects are more marked on movements originated in ipsilateral cortex. Stimulation of the corpus subthalamicum produces contraction of the dorsal midline musculature of the opposite side. Stimulation of the region of the red nucleus produces contraction of the ipsilateral dorsal midline musculature. Stimulation of the centrum medianum produces contraction of the opposite facial muscles and clawing of the opposite side of the mandible. W. M. H.

Symmetric cerebral calcification, particularly of the basal ganglia, demonstrable roentgenographically: calcification of the finer cerebral blood vessels. L. M. Eaton, J. D. Camp, and J. C. Love (Arch. Neurol. Psychiat., Chicago, 1939, **41**, 921—942). W. M. H.

Dilated cavum septi pellucidi and juxtaventricular cavities. A. F. Liber (Acta neerland. Morph., 1938, **2**, 4—19).—3 cases of dilated cavum septi pellucidi in human adults are described; juxtaventricular cavities were present near the head of the caudate nucleus in one case. No pathological changes were observed near the septum which could account for the size of the cavity. The lining of glial tissue and the absence of collagen indicate that the cavum septi pellucidi is not derived from the interhemispheric fissure. H. L. H. G.

Study of influence of emotions and effects on surface temperature of human body. L. Ziegler and P. Cash (Amer. J. Psychiat., 1938, **95**, 677—696). G. M. F.

Simple technique for psycho-galvanography. N. Hoelandt and B. Stokvis (Schweiz. med. Wschr., 1939, **69**, 384—386).—Psycho-galvanic reflexes were optically recorded, using an amplifier–oscillograph system. Respiratory variations in the records are described. A. S.

Conditioned reactions to position and angular acceleration. E. A. Spiegel and M. J. Oppenheimer (Amer. J. Physiol., 1939, **125**, 265—275).—Typical conditioned reactions to position were developed in dogs. Combinations of a certain position

with uniform motion in a certain direction could also be conditioned. These reactions can still be obtained after elimination of the labyrinth, the posterior columns, and the dorsal spino-cerebellar systems. Conditioned reactions to angular acceleration around a vertical axis were readily obtained; threshold was at or below 2—3° per sec. per sec. Discrimination of the direction of angular acceleration could also be established. Removal of the labyrinth led to loss of discrimination of direction of rotation around a vertical axis, rotation being at a low acceleration. M. W. G.

Solution of multiple choice problems by chimpanzees. K. W. Spence (Comp. Psychol. Monogr., 1939, **15**, Mono. 75).—17 chimpanzees (2—22 years) were subjects in an experiment designed to throw light on the basis of the solution and the nature of the reaction tendencies exhibited prior to solution of multiple choice problems. The animals were required to find food by pushing open with one finger one of a series of identical boxes. The apparatus allowed variation in the no. of boxes and in the position of the baited box in the series. Correct differentiation involved learning the position of the baited box relative to other members of the series. This task proved to be within the capacity of almost all the chimpanzees. Choosing the middle box of 5 proved to be the most difficult problem, and analysis of the individual records showed 2 types of learning on this problem, (1) a generalised mode of solution and (2) a sp. solution of each setting. On other problems learning was predominantly of the generalised type, the animals being able to transfer to control settings with greater than chance accuracy. During the pre-solution period of the middle box problem there was little evidence of any systematic reaction-tendencies, but the majority of subjects showed these systematic reactions during the pre-solution period of the other problems. The abandonment of a systematic reaction usually took place in an abrupt manner, the learning curves showing the drop usually interpreted as showing "insight." The author discusses the difficulty of reconciling such an interpretation of these sudden drops with the fact that the correct response was frequently abandoned for an incorrect one in just such an abrupt manner. The learning curves also show that there is very little evidence if any age differences in the chimpanzees' capacity to solve such problems. K. J. W. C.

Lissauer's paralysis. P. Divry (J. belge Neurol. Psychiat., 1939, **39**, 5—17).—A case, clinically atypical, showed at necropsy marked atrophy of right hemisphere, particularly in the parieto-occipital and frontal regions, the concomitant changes of status spongiosus, vascular hyperplasi, and demyelination being most evident in the cornu ammonis. W. K. S.

Spatial summation of thermal stimuli. E. Geblewicz (Compt. rend. Soc. Biol., 1939, **130**, 638—640).—With prolonged stimuli (20 sec.) the threshold intensity varies inversely with the area stimulated, while with brief stimuli (60 σ) the necessary intensity is expressed by the formula $I = aS + b$ (I = intensity, S = area stimulated, and a and b are consts.). The spatial summation is therefore much less with short stimuli. P. C. W.

Clinical recognition of Pick's disease. L. Benedek and T. Lehoczky (Brain, 1939, **62**, 104—122).—The diagnosis of Pick's disease from clinical signs by encephalography, cerebral angiogram, and brain puncture is discussed in detail on the basis of 3 cases. K. S.

Electroencephalography in clinical neurology. D. J. Williams and F. A. Gibbs (Arch. Neurol. Psychiat., Chicago, 1939, **41**, 519—534).—In 50 cases examined electroencephalographically there was close correspondence between the site of the lesion predicted to that subsequently demonstrated by operation or post-mortem. In several cases the nature of the lesion was also deduced correctly from the electroencephalogram. In 41 cases initially suspected of cerebral disease the electroencephalogram gave no evidence of an organic lesion. The final clinical opinion in these cases was that no organic cerebral disease existed. Electroencephalography was very valuable as a diagnostic procedure in neurology. A. M. B.

Cerebral manifestations in the new-born. A. Levinson (Arch. Pediat., 1939, **56**, 210—222).—A general review. C. J. C. B.

Electro-cortical studies on point of action of various hypnotics. Z. Drohocki and J. Drohocka (Klin. Woch., 1939, **18**, 606—608).—Nembutal, chloral hydrate, and urethane produce changes in the electrogram in different parts of the brain including the cortex and thalamus; hypnotics cannot be divided into cerebral and brain-stem groups. E. M. J.

Electroencephalographic analyses of behaviour problem children. H. Jaspe and C. Bradley (Amer. J. Psychiat., 1938, **95**, 640—657).—Electroencephalographic study of 71 children showed that a large % have an organic basis for their abnormal behaviour. G. M. F.

Electroencephalographic studies of epilepsy. O. Sager and A. Kreindler (J. belge Neurol. Psychiat., 1939, **39**, 265—275).—The subcortical origin postulated for the groupage of waves, in chronic decorticated dogs under evipan and in atropinised hares, is extended, by analogy, to the abnormal appearance of the electroencephalogram in epilepsy. W. K. S.

Cortical response to sensory stimulation under deep barbiturate narcosis. A. Forbes and B. R. Morison (J. Neurophysiol., 1939, **2**, 112—128).—A widespread electric response of the cat's cerebral cortex to stimulation of the sciatic appears in the deeper stages of pentobarbital, avertin, or dial anæsthesia. This "secondary discharge" follows only the first of a series of stimuli above a critical frequency of about 3 per sec.; it is widespread in the cortex and appears with nearly the same latency and duration in both hemispheres on stimulation of one sciatic nerve. The afferent volley may act on the thalamus or other subcortical centres whence the discharge is distributed throughout the cortex. S. Cr.

Search for changes in direct-current potentials of the head during sleep. H. Davis, P. A. Davis, A. L. Loomis, E. N. Harvey, and G. Hobart (J. Neurophysiol., 1939, **2**, 129—135).—Methods are devised for measuring the d.c. potentials in the human subject. No correlation could be detected between the stage of sleep and the d.c. p.d., or changes observed between chest and head, scalp and mastoid region, frontal and occipital regions, or right and left sides of the head. S. Cr.

Factors controlling brain potentials in the cat. H. H. Dubner and R. W. Gerard (J. Neurophysiol., 1939, **2**, 142—152).—The normal spontaneous rhythms of the cat's geniculate body, especially the dominant one at 3 per sec., are independent of impulses reaching these neurones from optic nerves, cortex, or brain stem. The background level of excitation, determined largely by optic impulses, strongly influences their character. The slow rhythm fades out over hours in the dark and is reinitiated after brief illumination. The enhanced spontaneous and evoked optic potentials induced by K, citrate, acid, strychnine, insulin, and polarising currents, and the diminished potentials resulting from Ca, alkali, and glucose, are described and interpreted. S. Cr.

Control of the potential rhythm of the isolated frog brain. B. Libet and R. W. Gerard (J. Neurophysiol., 1939, **2**, 153—169).—Factors of the electrical activity of the olfactory bulb of the isolated frog brain were investigated. Isolation increases wave size and regularity for a time. Electrical stimulation of the olfactory nerve increases bulb potentials and partly restores a "run down" brain. Rise of temp. improves regularity and increases frequency. Doubled osmotic pressure, radically reduced Na ions, moderately increased Ca or Mg ions, or lowered p_H produce slow waves; increased K, Na, or p_H, and reduced Ca produce fast ones. Na and K are antagonistic to Ca. Anions are generally without marked effect. The relation between single neurone rhythms and recorded potentials are discussed and parallels are pointed out between rhythmic potentials of nerve and of cerebral neurones. S. Cr.

Brain wave frequencies and cellular metabolism effects of dinitrophenol. H. Hoagland, M. A. Rubin, and D. E. Cameron (J. Neurophysiol., 1939, **2**, 170—172).—The independent rhythms from the occiput and the vertex were studied simultaneously before and after doses of dinitrophenol and were found to be accelerated along two smooth curves, thus conforming with the view that the frequencies are a measure of cortical respiration. S. Cr.

Ætiological factors in pathology of stammering. I. Latif (Brit. J. med. Psychol., 1938, **17**, 307—318).—Psychological theories of the ætiology of stammering are reviewed. Mass treatment of the problem is inadequate; each case must be individually treated. G. M. F.

Immediate and late complications of cerebral trauma. E. Krebs (Rev. Neurol., 1939, **71**, 369—388).—Diagnosis and operative indications for both the immediate and late complications of cerebral trauma are discussed. W. K. S.

Effects of ligation of left anterior cerebral artery. J. L. Poppen (Arch. Neurol. Psychiat., Chicago, 1939, **41**, 495—503).—Ligation of the left anterior cerebral artery was performed in 8 cases, bilateral ligation in 2. If the blood pressure can be prevented from falling by intravenous infusions, this operation can be performed without untoward changes in the state of consciousness. If this safeguard is not adopted consciousness is never regained. A. M. B.

"Silver cells" and "spirochæte-like" formations in multiple sclerosis and other diseases of central nervous system. G. B. Hassin and I. B. Diamond (Arch. Neurol. Psychiat., Chicago, 1939, **41**, 471—483).—Granules with affinity for Ag stains are prominent in multiple sclerosis, subacute combined degeneration, Friedreich's ataxia, and other degenerative diseases. The granules are situated mainly between the axon and the myelin. They are probably lipins. They may arrange themselves in chains of spirochæte-like shape, but are unrelated to spirochætes. A. M. B.

New syndrome of vascular headache: results of treatment with histamine. B. T. Horton, A. R. Maclean, and W. McK. Craig (Proc. Staff Mayo Clin., 1939, **14**, 257—260).—A type of vascular headache is described, associated with clinical and laboratory evidence of vasodilatation. The syndrome can be induced by the administration of histamine and relieved by giving histamine twice daily subcutaneously in gradually increasing doses. A. M. G.

Leptomeningeal neuroblastoma. R. Carillo and M. Oribe (Arch. argent. Neurol., 1939, **20**, 172—207). W. W.

Unusual case of grasp reflex; volitional and reflex components. A. M. Stewart-Wallace (J. Neurol. Psychiat., 1939, **2**, 149—153).—In a patient with a severe hemiplegia affecting the arm more than the leg there was a powerful grasp reflex in the otherwise almost completely paralysed hand. The grasping response was dependent on the tactile sensation of moving objects. A motionless object applied to the hand evoked very little response, nor did visual perception of objects evoke the grasp response. K. S.

Juvenile tabo-paresis in siblings. F. Wawrzik (Arch. Psychiat. Nervenkr., 1938, **108**, 661—667).—Two brothers whose father suffered from "metalues," the mother from tertiary syphilis, showed the same symptoms of tabo-paresis. The first and dominant symptom was in both cases optic atrophy. K. S.

Neuropathology of the dog. H. J. Scherer and L. Collet (J. belge Neurol. Psychiat., 1939, **39**, 132).—Three distinctive conditions in dogs are here described: one with marked proliferation of cortical vessels, another with acute foci of demyelination and appearance of sclerosis in plaques, the third with advanced chronic sclerosis and hydrocephalus from reduction in vol. of the white matter. W. M. H.

Histological changes in the brain in Mongolism. A. MEYER and T. B. JONES (J. ment. Sci., 1939, **85**, 206—221).—In 10 out of 15 cases there was widespread proliferation of the glia, particularly in cerebral and cerebellar white matter and in pons and medulla, often unaccompanied by corresponding changes in myelin and cell picture. The changes are not regarded as a substrate of the defect in Mongolism. There was no common factor which would account for the changes found in the cases. G. D. G.

Disturbances of glucose tolerance and of the acid–base equilibrium in manic-depressive insanity. J. K. MARSHALL (J. ment. Sci., 1939, **85**, 222—244).—No correlation was observed between the disturbance of carbohydrate metabolism, as seen in the glucose tolerance test, and disturbance of the acid–base equilibrium, as seen from urinary p_H and NH_3. G. D. G.

Distinctive anatomico-clinical form of chronic alcoholism : laminary cortical sclerosis of alcoholic origin. F. MOREL (Rev. Neurol., 1939, **71**, 280—288).—Study of the macroglia was carried out in 420 autopsies, in 4 of which the sole feature was a distinctive proliferation confined to the 3rd layer of cortex, most marked in the frontal lobe and associated with a degree of microglial hypertrophy. The clinical features of these cases were purely those of chronic alcoholism. W. K. S.

The latter half of the life of an epileptic. A. HALL (Lancet, 1939, **236**, 1146—1151).—The frequency of fits and their control by drugs are described in an epileptic subject who was observed for 28 years. C. A. K.

The microglia. P. DEL RIO-HORTEGA (Lancet, 1939, **236**, 1023—1026).—A review. C. A. K.

Narcosis therapy : critical review. R. D. GILLESPIE (J. Neurol. Psychiat., 1939, **2**, 45—65). K. S.

Results of eighteen months of benzedrine sulphate therapy in psychiatry. E. DAVIDOFF and E. REIFENSTEIN (Amer. J. Psychiat., 1939, **95**, 945—970).—A general review of the use and contra-indications of benzedrine sulphate in organic and functional cases. The abs. contra-indications are hypertension, coronary arterial disease, and excitement. It has been found useful in organic psychosis of recent origin particularly due to alcohol and in organic non-psychotic conditions, narcolepsy, and post-encephalitic Parkinsonism. G. M. F.

Adrenaline secretion during experimentally induced epilepsy. A. TOURNADE, R. RAYNAUD, and G. CHARDON (Compt. rend. Soc. Biol., 1939, **130**, 632—634).—Measurement of vol. changes of a grafted kidney and cross-circulation experiments show that the hypertension produced in epilepsy induced by stimulation of the sigmoid gyrus is entirely of nervous origin. Adrenaline is secreted only if the stimulation is very prolonged. P. C. W.

Pathologic picture of thujone and monobromated camphor convulsions ; comparison with human epilepsy. L. OPPER (Arch. Neurol. Psychiat., Chicago, 1939, **41**, 460—470).—Cats and rabbits were convulsed with camphor or with thujone. Histological examination of the brains showed necrobiosis, sclerosis of ganglion cells, chromatolysis, and petechial hæmorrhages. These lesions were largely confined to the cerebral cortex. Many of these changes are reversible, for the extent of the damage observed is not dependent on the no. of series of seizures, but is the greater the shorter is the interval between the last series and death. A. M. B.

Action of metrazol on hypothalamus of cat. J. H. MASSERMAN and E. W. HAERTIG (Arch. Neurol. Psychiat., Chicago, 1939, **41**, 504—510).—In cats, intravenous metrazol causes widespread tonic and clonic convulsions. It does not affect the electrical reactions of the hypothalamus. Injection of a small dose of metrazol directly into the hypothalamus of a conscious cat induces great motor restlessness, vicious combative reactions, and loud vocalisation. Convulsions of the skeletal musculature do not occur. A. M. B.

Administration of azoman as central convulsant. R. DE MONTMOLLIN (Schweiz. med. Wschr., 1939, **69**, 482—483).—4-*cyclo*Hexyl-3-ethyl-1 : 2 : 4-triazole is recommended in the convulsant treatment of mental disease. The patients prefer azoman to cardiazol treatment. It can be given by intramuscular injection. Repetition of the convulsion was occasionally observed a few min. after termination of the first. A. S.

Results with pharmacological shock treatment of schizophrenia. K. M. BOWMAN, J. WORTS, H. FINGERT, and G. KAGAN (Amer. J. Psychiat., 1939, **95**, 787—791).—It may be necessary to alternate between insulin and such convulsive drugs as metrazol. Insulin, however, remains the drug of choice. G. M. F.

Clinical study of effects of short periods of severe anoxia with special reference to the mechanism of action of cardiazol "shock." R. FRASER and F. REITMAN (J. Neurol. Psychiat., 1939, **2**, 125—136).—Four schizophrenic patients, made to breathe an atm. of low O_2 concn. (3·5% and 2%) for periods of 2 and 3 min., showed in 44 instances no resemblance to cardiazol shock, nor was there any improvement of the clinical state. K. S.

Brain potential changes in man induced by metrazol. M. A. RUBIN and C. WALL (J. Neurol. Psychiat., 1939, **2**, 107—114).—Eleven schizophrenic patients were examined before and during the administration of metrazol. In cases in which the injection had no clinical effect there was no change in the electroencephalogram (e.e.g.); cases in which metrazol evoked a fit or an emotional alteration showed characteristic changes of the e.e.g. Various types of e.e.g. are related to chemical changes in the blood produced by metrazol. K. S.

Effect of cardiazol convulsions on so-called "bulbocapnine catatonia" in monkey. A. KENNEDY (J. Neurol. Psychiat., 1939, **2**, 115—124).—The effect of cardiazol on "bulbocapnine catatonia" was studied in 5 adult macaque monkeys. Cardiazol convulsions prolonged the action of the drug as evidenced by akinesia and reappearance of neo-natal grasp reflex. K. S.

Experience with camphor metrazol treatment of schizophrenia at Buffalo City Hospital, N.Y. A. L. C. Ulrich (Amer. J. Psychiat., 1939, **95**, 807—813).—The results in the treatment of 75 cases of schizophrenia of long standing justify the use of camphor metrazol. G. M. F.

Effects of metrazol convulsions. E. A. Strecker, B. J. Alpers, J. A. Flaherty, and J. Hughes (Arch. Neurol. Psychiat., Chicago, 1939, **41**, 996—1003).—In the brains of 4 out of 7 monkeys after a series of intra-arterial injections cellular changes were found, together with subarachnoid hæmorrhage. W. M. H.

Mechanism of the cardiazol convulsion. D. J. Watterson and R. Macdonald (J. ment. Sci., 1939, **85**, 392—405).—Injection of NaCN simultaneously with cardiazol shows that after intravenous injection the cardiazol has passed the carotid sinus before the fit begins. The fit is clearly demarcated from the reflex hyperpnœa produced by the NaCN; the interval following the hyperpnœa is probably long enough to allow cardiazol to reach all parts of the brain. The production of fits by minimal doses of cardiazol is inhibited by carbamylcholine or acetyl-β-methylcholine, and NaCN, but not by caffeine. It is probable that cerebral vasodilatation inhibits the action of cardiazol. There is no certain evidence that the cardiazol convulsion is caused or accompanied by cerebral vasoconstriction. G. D. G.

Insulin and cardiazol treatment of schizophrenia. L. Meduna and B. Rohny (Lancet, 1939, **236**, 1139—1142).—Cardiazol convulsions raise the sugar, lactic acid, and ketone levels of the blood. Insulin does not change the lactic acid level. C. A. K.

Insulin-hypoglycæmia treatment of schizophrenia. E. O. Nive, S. Weisz, and T. H. Harris (Amer. J. Psychiat., 1939, **95**, 799—807).—In 151 cases of schizophrenia 106 were treated with insulin; 58% benefited, 39% remained unchanged, and 3 died. The paranoid type maintained improvement best, catatonic types to a less degree, but no hebephrenic cases reached complete remission. G. M. F.

Cerebral metabolism and electrical activity during insulin hypoglycæmia in man. H. E. Himwich, Z. Hadidian, J. F. Fazekas, and H. Hoagland (Amer. J. Physiol., 1939, **125**, 578—585).—Chronic schizophrenics who had attained their coma-producing doses of insulin (to obtain best results a much longer period of coma is necessary than in the treatment of acute cases of dementia præcox) were studied. Simultaneous observations were made of the electroencephalographic changes, O_2 utilisation of the brain, and of blood-sugar levels. There is a direct relationship between the frequency of the α-waves and cerebral O_2 consumption, both declining during hypoglycæmia and increasing after carbohydrate administration. The δ index displays an inverse relationship for it is augmented during the period of diminished O_2 utilisation by the brain. M. W. G.

Electrical activity of cerebral cortex in insulin hypoglycæmia and in different conditions modifying the metabolism of the centres. G. Moruzzi (Arch. int. Physiol., 1939, **48**, 45—101).—The electrical activity of the cerebral cortex of cats and rabbits under local or general (barbiturate) anæsthesia or with "isolated brain" (Bremer) was recorded in various conditions. With moderate insulin hypoglycæmia large electrical variations (1 mv.) lasting 0·2—0·4 sec. and of frequency 2—3 per sec. appeared. Spontaneous electrical activity stopped at convulsive blood-sugar levels, except for spontaneous or electrically-initiated epileptic waves. In the convulsive condition intra-cortical synaptic transmission was still possible. Intravenous glucose restored normal electrical responses but cortical and subcortical levels were not restored simultaneously. In hypoglycæmia, intravenous lactate and pyruvate were ineffective as restoratives. NaF stops activity above a certain concn. in the blood; the change is reversible. Methylene-blue intravenously increased the activity of the cortex of the "isolated brain" (cat). W. Bu.

Acetylcholine metabolism in central nervous system. Effects of potassium and other cations on acetylcholine liberation. P. J. G. Mann, M. Tennenbaum, and J. H. Quastel (Biochem. J., 1939, **33**, 822—835).—Addition of $K^{\cdot}$ (0·027M.) to an eserine-containing medium increases the acetylcholine formation by brain slices, which may reach 40 μg. per g. of wet tissue. Much higher concns. of $K^{\cdot}$ inhibit the synthesis of acetylcholine, as do also added $Ca^{\cdot\cdot}$ and $Mg^{\cdot\cdot}$. Rb and, in lesser degree, Cs resemble K in their action; this action is less marked in PO_4''' than in $NaHCO_3$ media, or when minced brain tissue replaces intact slices. In all cases a breakdown of "combined" acetylcholine, which possibly consists of a complex with its synthesising enzyme, gives rise to an equal amount of free acetylcholine. P. G. M.

Chemical study on fluids obtained from cerebral cysts. K. Stern (Brain, 1939, **62**, 88—95).—Quant. examination of the protein (albumin and globulin), Cl, Ca, Mg, urea, and glucose in 56 cerebral cysts, and the comparison with the same constituents in the subjects' blood, showed that the ratio is identical with that in exudates and transudates in other diseases. There is no regular relation between the histological nature of the cyst and the chemical constituents of its fluid. K. S.

Korsakoff psychosis in spontaneous subarachnoid hæmorrhage. S. Tarachow (Amer. J. Psychiat., 1939, **95**, 887—899).—Korsakoff psychosis, far from being associated only with alcoholic polyneuritis, has been reported in a variety of conditions. In 105 cases of subarachnoid hæmorrhage 3 cases are reported. All returned to their normal mental condition. G. M. F.

Quantitative absorption of phenolsulphonephthalein from subarachnoid space. W. J. Gardner and W. A. Nosik (Arch. Neurol. Psychiat., Chicago, 1939, **41**, 484—488).—Phenosulphonephthalein injected intrathecally into normal persons is recoverable from the urine passed during the next 2 hr. in amounts varying from 12 to 30%. This variability in normal subjects makes the test of no val. in assessing disease of the c.s.f. absorbing mechanism. A. M. B.

Repair in experimental pneumococcal meningitis. P. Gross, F. B. Cooper, and M. Lewis (Amer. J. Path., 1939, **25**, 193—198).—In the central nervous system of 59 rats that recovered from pneumococcal meningitis, exudative or proliferative changes were found in the meninges in every case. Scars, cellular infiltration, and Ca or hæmosiderin deposits in the brain parenchyma were found in ½ the rats and spinal meningeal changes in ⅓ of the rats. The spinal changes were mild and not associated with the parenchymal lesions. (8 photomicrographs.) C. J. C. B.

Use of hypertonic solutions in treatment of increased cerebrospinal fluid pressure. M. Ernst (Münch. med. Wschr., 1939, **86**, 773—775).—Intravenous injection of up to 60 c.c. of a 30—50% glucose solution is recommended in the treatment of acute increase in c.s.f. pressure. A. S.

Circulation of cerebrospinal fluid and intrathecal therapy. G. Boschi (Münch. med. Wschr., 1939, **86**, 725—729).—A lecture. A. S.

Causation of hydrocephalus after removal of a subarachnoid sacral meningocele. O. Wustmann (Dtsch. med. Wschr., 1939, **65**, 671—673).—A lecture, with special reference to theories of formation of c.s.f. A. S.

Blood- and cerebrospinal fluid-sugar and chloride content in meningitis. E. Hendry (Arch. Dis. Childh., 1939, **14**, 159—172).—In normals, variations in c.s.f.-sugar depended on variations in blood-sugar although lagging behind it. The lower limit of normal in the c.s.f. was 50 mg.-% and the ratio of c.s.f.- to blood-sugar was 0·6. In tuberculous meningitis the c.s.f.-sugar fell as the disease progressed as did the c.s.f.–blood-sugar ratio. If convulsions occur, c.s.f.-sugar may rise to normal, but the blood-sugar also rises, the ratio remaining below normal. In meningococcal meningitis, the c.s.f.-sugar is markedly reduced and may be absent; the ratio is subnormal; both return to normal on recovery. C.s.f.-Cl is reduced in all forms of meningitis owing to a reduction in the blood-Cl. Cl reduction in the early stages of tuberculous meningitis is less const. than reduction in c.s.f.-sugar. C. J. C. B.

Determination of proteins in cerebrospinal fluid. C. A. Sagastume, D. Vucetich, and R. Nico (Rev. Fac. Cienc., Quím. La Plata, 1938, **13**, 67—71).—Phenol (3 ml.), 40% formaldehyde (3 ml.), and sulphosalicylic acid (3 g.) in water (100 ml.) give with liquids containing albumin a ppt., transformed on shaking into a uniform and stable turbidity which is compared with the turbidity obtained by mixing cholesterol in alcohol with water. Standardisation is effected by the Folin–Farmer method. F. R. G.

(x) SENSE ORGANS.

Fœtus with one eye (*Cyclops*). M. N. De and H. K. Dutta (J. Anat., Lond., 1939, **73**, 499—500).—Description of a 14-in. female fœtus with only one eye in the centre of the face. Two optic nerves emerge from the eye, pass through the optic foramina, and continue without chiasma formation. A. Gl.

Cultivation of trachomatous conjunctival epithelium *in vitro*. P. Thygeson (Arch. Ophthal., N.Y., 1939, **21**, 229—234).—Trachomatous epithelium grew normally and ceased to be infective to baboons or to show inclusion bodies. E. E. P.

Formic acid content of ocular tissues. A. C. Krause and R. Weekers (Arch. Ophtal., Paris, 1939, **3**, 225—229).—The formic acid concn. in cattle was about 1 mg. per 100 g. for all tissues except choroid and optic nerve, which were higher, and iris which was highest at 2·5 mg. E. E. P.

Ocular tissue temperatures in normal rabbits and after syphilitic and spirochætal infection. A. Bessemans and J. van Canneyt (Arch. Ophtal., Paris, 1939, **3**, 18—30).—The temp. in all such eyes increase from cornea inwards over 3°. Lesions due to syphilitic and rabbit treponemata occur in sites where the temp. is low. E. E. P.

Mydriasis with conjunctival application of adrenaline. L. Weekers, P. Joiris, and F. Bonhomme (Arch. Ophtal., Paris, 1939, **3**, 97—108).—A 2% solution of adrenaline is mydriatic on conjunctival instillation, and non-irritant if made isotonic and isoelectric with tear fluid as by addition of 0·3% chloretone and 0·3% $NaHSO_3$ to H_3BO_3 solution. Mydriasis is strong and accommodation unaffected. E. E. P.

(A) Comparison of the mydriatic action of atropine sulphate, citrate, and phenylpropionate on the pupil of the enucleated frog eye. (B) Effect of various sodium salts on the pupil of *Rana esculenta*. J. Régnier and A. Quevauviller (Compt. rend. Soc. Biol., 1939, **130**, 1461—1463, 1584—1586).—(A) The mydriatic action of atropine phenylpropionate is less than that of the sulphate. Atropine citrate produces miosis.

(B) Na sulphate, phenylpropionate, and citrate in isotonic glucose solution have no apprecable effect on the frog's pupil. H. O. S.

Lens induction. M. W. Woerdeman (Proc. K. Akad. Wetensch. Amsterdam, 1939, **42**, 290—292).—Some of the conflicting results of lens development obtained in transplantation experiments are explained in terms of movements of the implanted eye vesicle relative to the ectoderm, which is induced, due to the growth of neighbouring organs. The experiments described were made on *Rana esculenta* and on *Triton taeniatus*. W. F. F.

Effect of parathyroid hormone on the permeability of lens capsule to calcium. J. H. Clark (Amer. J. Physiol., 1939, **126**, 136—141).—A method for testing the effect of various substances on the permeability of the lens capsule to Ca is described. Fresh lenses were impermeable to Ca, but the permeability increased if the eyes were kept in a refrigerator for one or more days. The addition of parathyroid extract to the solution in which lenses (made permeable to Ca by keeping) were immersed, prevented the penetration of Ca into the lens. This effect is attributed to the formation of a "Ca hormone complex," as a result of which the Ca can no longer diffuse through cell membranes. The suggestion is offered that cataract occurring after

parathyroidectomy may be due to the presence in the lens of protein denatured by ultra-violet light and to the penetration of Ca into the lens due to the absence of the parathyroid hormone. Ultra-violet irradiation of whole isolated lenses, changes in [H·] from p_H 6 to 8, ascorbic acid, and viosterol had no effect on the permeability of the capsule to Ca. M. C. B.

Nitrogen content of cataractous and sclerosed human lenses. P. W. Salit (Acta ophthal., Kbn., 1939, **17**, 81—88).—All types of cataractous and sclerosed human lenses show an abs. deficit of N proportional to the degree of damage. While the N concn. on wet wt. decreases, that on dry wt. is const. and equal to that of normal (bovine) lenses. E. E. P.

Sensitivity of the retina to the ultra-violet spectrum. S. I. Vavilov (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 373—375).—Further evidence in favour of ultra-violet absorption by the cryst. lens of the eye is given. W. F. F.

Physiological performance of fish eyes in ultra-violet light. E. Merker (Zool. Jb. [Physiol.], 1939, **59**, 391—428).—λλ of around 366 mμ. caused both the cones and the pigment of the dark-adapted stickleback retina to move into the light-adaptation position. Control experiments to test the effect of the fluorescent λλ produced in the eye during these experiments showed that these were always less effective than the ultra-violet. Although the stickleback was able to see and catch food in light of 366 mμ. no electroretinogram could be obtained at this λ. λλ of 313 mμ. and below had practically no effect on the stickleback retina and what effect there was seemed to be due to fluorescence. The stickleback retina receives 31% of the light incident on the cornea at 366 mμ. but only 2·6% at 313 mμ. K. T.

Influence of central nervous system on pigment migration in frog retina. H. M. Burian (Amer. J. Ophthal., 1939, **22**, 16—26).—Engelmann's finding that strychnine injections cause the pigment of the dark-adapted frog retina to advance over the rods was confirmed. Naphthalene poisoning had the opposite effect, *i.e.*, the pigment was retracted in light-adapted animals. Section of the optic nerve decreased but did not abolish the effect of these two poisons. Agents which induce the cones to take up the light position may do so by producing an acid reaction in the retina. K. T.

Retinæ of two oppossum genera. G. L. Walls (J. Morph., 1939, **64**, 67—87).—The eyes of *Didelphis virginiana* and *Marmosa mexicana* are adapted for scotopotic vision. In *Didelphis* a tapetum lucidum is formed by the pigment epithelial cells. These cells are enlarged, devoid of pigment, and packed with reflective material of unknown composition. The retinal capillaries in *Didelphis* extend to the outer limiting membrane. Both *Didelphis* and *Marmosa* have abundant rods and scanty cones of three types: double cones, droplet-bearing single cones, and droplet-free single cones. A. Gl.

Recent photochemical and electrophysiological research on adaptation in the vertebrate retina. R. Granit (Doc. ophthal., 1938, **1**, 7—77).—A full review of the recent work. K. T.

Effects of chemical stimuli on retinal vessels. I. Puntenney (Arch. Ophthal., N.Y., 1939, **21**, 581—597).—The calibre of retinal vessels in dogs was measured photographically. Nitrites and ethyl-β-methylcholine were without effect; after adrenaline the veins widened in half the cases; after mecholyl, all vessels became narrower in half the cases. Paracentesis was without effect. E. E. P.

Retrograde degeneration in optic nerves and retinal ganglion cells. P. J. Leinfelder (Trans. Amer. ophthal. Soc., 1938, **36**, 307—315).—Lesions were made electrolytically in the optic nerves, chiasma, or tracts of cats. Section of the chiasma or of one tract caused negligible myelin degeneration in the nerves, and bilateral tract lesions only slightly more. Retinal ganglion cell degeneration occurred when both tracts were divided. E. E. P.

Double function of ocular muscles. F. Edridge Green (J. Physiol., 1939, **95**, 62—63p).—Evidence is obtained that a separation of positive and negative after-images is due to the contraction of the eye muscles pressing on the eye and moving the photochemical fluid. In photography a fresh film is required for each photograph; this is accomplished in the eye by the pressure caused by contraction of the eye muscles. J. A. C.

Critical frequency of flicker and indirect stimuli. S. V. Kravkov (Compt. rend. Acad. Sci. U.R.S.S., 1939, **22**, 64—66).—An indirect stimulus (odour or sound) may change the sensitivity of the eye in man, and may simultaneously increase or decrease the crit. frequency of flicker according to the intensity of the light. W. F. F.

Regularities underlying the effect of indirect stimuli (Nebenreiz) on the discrimination sensitivity of the eye. N. T. Fedorov (Compt. rend. Acad. Sci. U.R.S.S., 1939, **22**, 70—74).—All changes in the discrimination sensitivity of the eye, in man, induced by application of indirect stimuli can be explained by the assumption that the change in the threshold caused by the indirect stimulus does not depend on the intensity of the direct stimulus, and is determined only by the intensity of the indirect stimulus. A mathematical analysis is given. W. F. F.

Normal dark-adaptation curves by light threshold method measured with Birch-Hirschfeld photometer. K. H. Zaffke (v. Graefe's Arch. Ophthal., 1939, **140**, 61—69).—A practical method of determining the presence and extent of hemeralopia by the use of a standard or normal curve of dark adaptation, expressed in standard light units. The course of dark adaptation was determined over a period of 39 min. in 30 healthy, normal individuals, aged 18—30 years. The Birch-Hirschfeld 5-point adaptometer used was calibrated in millilux by means of a Pulfrich photometer. Daylight was used for light-adapting the observers, the course of dark adaptation being interrupted from the 9th to the 12th min. by an artificial light stimulus. Observations were taken every 3 min., the observed range being

from 700 to 0·01 millilux. From the data a normal or average curve of dark adaptation was made, and evaluating the statistical distribution, a limiting curve constructed, beyond which the observations of normal observers should not lie. Minor differences between the normal curve found by the author, and that found by Matthey, were ascribed to the use by the latter of a mydriatic. L. R. P.

Dysaptation in schools at Djursholm. E. Abramson and H. Oigaard (Skand. Arch. Physiol., 1939, **82**, 49—60).—Confirmation of Abramson's results (1938) pointing to latent *A*-avitaminosis in Sweden. Successive measurements were made, using a biophotometer, of dark adaptation changes in a control group, and in children receiving daily dosage with vitamin-*A*. Performance appreciably improved in the majority of the latter. At the first examination, using the norms for deficiency in -*A* suggested by Jeans and Zentmire, 28% were found normal, and approx. 50% sub-normal, of the 67 children examined. For the ages tested, 7—12 years, dark-adaptation performance improved with age. L. R. P.

Vitamin-*A* and dark adaptation. S. Hecht and J. Mandelbaum (J. Amer. med. Assoc., 1939, **112**, 1910—1916).—Only under controlled conditions of light adaptation, retinal area and location, stimulus colour and duration, can variations in the light min. during dark adaptation be used as preclinical evidence of *A*-avitaminosis. Examination of 110 well nourished individuals was made under such conditions, viz., 3° test-field, situated 7° nasally, viewed with the right eye, with intermittent stimulus of 0·2 sec. and previous light adaptation of 1500 millilamberts for 3 min. Graphs of log intensity with time show cone and rod components, with well defined cone–rod transition. There were individual differences, unaffected by subsequent dosage with vitamin-*A*, some difference due to age, mainly in the cone component, but no sex difference. Deprivation of -*A* in 4 observers gave steady rise in cone and rod thresholds, with slow return after therapy. Pathological deprivation shows additional retardation of the cone–rod transition. L. R. P.

Vitamin therapy in ophthalmic practice. J. Laval (Amer. J. Ophthal., 1939, **22**, 33—37).—A general account of the known effects of various vitamins on the eye and of the author's experience of vitamin therapy. Administration of -*A* has no effect on the night blindness of retinitis pigmentosa. K. T.

Measurements on direct and indirect adaptation by means of a binocular method. J. F. Schouten and L. S. Ornstein (J. Opt. Soc. Amer., 1939, **29**, 168—182).—In a binocular matching apparatus the left eye views a semicircular field of fixed brightness. The right eye fixates another semicircular test field of variable brightness. A light in another part of the field of vision of the right eye makes the test field at the fovea appear less bright, but by adjusting the brightness the two semicircular fields can be made to match exactly. Two adaptative processes can be distinguished, viz., α- and β-adaptation. α-Adaptation is probably due to nervous interaction in the retina, the sensitivity of the fovea being reduced to about $\frac{1}{10}$ in $\frac{1}{10}$ sec., but thereafter is const. During illumination β-adaptation is occurring since the subsequent recovery of sensitivity at the fovea is slowed by an increase in exposure time to the extra-foveal light. Recovery of sensitivity of that part of the retina exposed directly to illumination takes a course identical with that induced indirectly. Experiments were also made with coloured light and with various types of glare. K. T.

Effects of veiling glare in binocular vision. B. B. Smith and R. W. Pickford (Nature, 1939, **143**, 804).—Subjects were asked to set two white discs at the same apparent distance away, one disc being seen through more "fog" than the other. Results varied amongst subjects but usually each individual was consistent in his own judgment. K. T.

Binocular interdependence. III. An active principle. S. R. Wallace, jun. (J. Gen. psychol., 1939, **20**, 33—45).—In binocular vision a configured field dominates and causes suppression of an unfigured one; this effect is independent of the relative brightness and suggests that configuration is mediated by a different peripheral and central mechanism more than is brightness. K. J. W. C.

Directional sensitivity of the retina. W. S. Stiles (Sci. Prog., 1939, **33**, 676—689).—Photometric measurements, originally devised to measure pupil diameter indirectly, showed that the pupil is not a simple stop, *i.e.*, that there is not a simple proportionality between area of pupil and apparent brightness. Using a modified form of the brightness matching method, the discrepancy was found to be due to a fall in the relative luminous efficiency of rays as the point of entry moves from the centre of the pupil to the periphery. Such fall must be attributed to a directional sensitivity in the retinal units excited. Such a sensitivity might be due to a differential refraction effect, or, more improbably, to the presence of pigment particles between the cones. For coloured rays, there is a corresponding colour change, amounting to about 10 mμ., with point of entry. Such changes are explained in terms of trichromatic theory, assuming three systems of cones with appropriate spectral and directional sensitivities. Further evidence is adduced from extra-foveal threshold measurements with the dark-adapted eye, when the rods are found to be practically non-directional, and from similar measurements at the fovea. In the latter there is evidence of two types of cone, with max. sensitivity at about 440 and 540 mμ., and indications of a third, with max. sensitivity in the red. L. R. P.

Number of light-sensitive substances in the retina. N. T. Fedorov and V. I. Fedorova (Compt. rend. Acad. Sci. U.R.S.S., 1939, **22**, 75—80).—Experimental evidence, supported by mathematical analysis, is adduced for the view that the cones of the eye in man contain only one light-sensitive substance. W. F. F.

Correlations of different receptors in colour vision. S. V. Kaavkov (Compt. rend. Acad. Sci. U.R.S.S., 1939, **22**, 67—69).—Changes in colour-sensitivity, in man, with indirect stimuli (odour and

sound) are described in terms of normal trichromatic vision. W. F. F.

Appearance of small coloured fields and its significance. F. Stippel and H. Vollers (Arch. ges. Psychol., 1939, **103**, 160—202).—A discussion of experiments bearing on Ostwald's colour theory. K. J. W. C.

Psychologically unique yellow, green, and blue. F. L. Dummick and M. R. Hubbard (Amer. J. Psychol., 1939, **52**, 242—254).—10 subjects chose the following λλ as giving typical or psychologically unique yellow, green, and blue respectively: 582, 515, and 476 mμ. K. J. W. C.

"Subjective" colours from line patterns. M. B. Erb and K. M. Dallenbach (Amer. J. Psychol., 1939, **52**, 227—241).—A pattern of narrow black lines close together on a white background gives rise to the perception of colours, usually of low saturation and light tint, when regarded steadily for short periods of time. The hues, while predominantly yellow and blue, cover the entire spectral range; they are enhanced when fixation is not in the plane of the figure and are accompanied by a shimmering or streaming effect and other types of phenomenal movement. Slight eye movements are a necessary condition for the perception of these colours. K. J. W. C.

Orange granules of sensory cells of lateral line organs of amphibian larvæ. S. G. Bedell (J. comp. Neurol., 1939, **70**, 231—248).—Orange-coloured granules are found in the sensory cells of lateral line organs in the tadpoles of *Rana clamitans*, *R. catesbiana*, *R. pipiens*, *Hyla crucifer*, *Pseudacris feriarum*, and *Triturus viridescens*. These granules do not dissolve in alcohols, do not stain with Sudan, but give a positive Millon reaction. Under laboratory conditions the granules disappear but may reappear if the tadpoles are returned to their natural pond habitat. The granules disappear rather rapidly when the tadpoles are treated with solutions of methylene-blue, alcohol, acids, or salts or exposed to heat or light. A. Gl.

(xi) DUCTLESS GLANDS, EXCLUDING GONADS.

Influence of age and hormones on colloidal state of tissue-proteins. G. Benetato, R. Oprean, and N. Munteanu (J. Physiol. Path. gén., 1939, **37**, 110—128; cf. A., 1939, III, 320).—The sol. protein fraction of rat tissues was low at birth, reached a steady val. in adult life, and declined during senility. Thyroid, anterior pituitary, and male sex hormone had no effect on the senility, but cortin increased the sol. protein and prolonged life and ability to perform muscular work. C. A. A.

Relation of pituitary to blood-lipins. O. B. Houchin and C. W. Turner (Endocrinol., 1939, **24**, 638—644).—Pituitary extract made by Bergman and Turner's method caused in the rabbit a fall of 36% in plasma-fat which returned to normal in 24 hr. Extracts rich in lactogenic, carbohydrate metabolism, thyrotropic, and gonadotropic hormones failed to produce this effect, nor did adrenal cortex or thyroxine. V. J. W.

Hibernation and the endocrines. M. A. Foster, R. C. Foster, and R. K. Meyer (Endocrinol., 1939, **24**, 603—612).—Hypophysectomy during the breeding season causes the ground-squirrel to become poikilothermic, and injection of pituitary extract during hibernation causes a transient homoiothermic revival. V. J. W.

Anatomic associations of pituitary basophilism. A. D. Ecker (Proc. Staff Mayo Clin., 1939, **14**, 200—202).—The clinical syndrome of pituitary basophilism may be associated with: (1) hyperplasia or neoplasm of the adrenal cortex, (2) carcinoma of the thymus, (3) arrhenoblastoma of the ovary, (4) adenoma, hyperplasia, or hyalinisation of the basophil cells of the anterior pituitary. A. M. G.

Experimental production of adenoma of pituitary. I. H. Perry and M. S. Lockhead (Amer. J. Cancer, 1939, **35**, 422—423).—Of 131 female mice treated over long periods with œstrone (106 I.U. once or thrice weekly) 3 developed pituitary tumours; 2 of these mice (one spayed) had in addition mammary implants of 1 : 2 : 5 : 6-dibenzanthracene. E. B.

Hypophyseal cachexia. H. Curschmann (Med. Welt, 1939, **13**, 727—731).—A review. A. S.

Pituitrin anæmia. A. Gilman and L. Goodman (Nature, 1939, **143**, 379).—A reply to Dodds *et. al.*, (cf. A., 1935, 902). W. F. F.

Action of purified anterior pituitary extracts on blood-sugar and -lactic acid. R. Merten and K. Hinsberg (Z. ges. exp. Med., 1939, **105**, 281—297).—Repeated injections of anterior pituitary ultrafiltrates produce an initial increase in free blood-sugar which subsequently returns to normal whereas bound glucose is diminished. Blood-lactic acid was increased. A. S.

Action of anterior pituitary on liver-glycogen. R. Merten (Z. ges. exp. Med., 1939, **105**, 273—280).—Injection of anterior pituitary ultrafiltrates or extracts of normal or diabetic urine lowers the glycogen content of the liver of rats by 40—50% within 1½—2½ hr. A. S.

Effect of fasting on blood-sugar of hereditary dwarf mice [source of diabetogenic pituitary hormone]. A. Marshak, A. T. Fernald, and A. Marble (Amer. J. Physiol., 1939, **125**, 457—460).—After fasting for 48, 72, and 96 hr. the blood-sugar level of hereditary dwarf mice (which lack the acidophil cells of the anterior pituitary) is no lower than that of the normal animal. The anti-insular or blood-sugar-maintaining hormone of the anterior pituitary is therefore secreted either by basophil or chromophobe cells. M. W. G.

Specificity and related properties of the crustacean chromatophorotropic hormone. A. A. Abramowitz and R. K. Abramowitz (Biol. Bull. Woods Hole, 1938, **74**, 278—296).—A method is described for assaying the eye-stalk hormone by observing the expansion of the melanophores of blinded *Uca pugilator*. It is estimated that one eye-stalk contains about 0·2 μg. of hormone and the test is sensitive to 0·000016 μg. of hormone. Injection of distilled water into blinded crabs produces melanophore expansion. The effect seems to be due to

change of osmotic pressure. The effect of 16 drugs on the melanophores was tested. Only hyoscine hydrobromide had any effect, causing expansion. Extracts of various tissues other than the eye-stalks were inactive but extracts of the whole body of animals, whose eye-stalks had been removed, even for a month, caused expansion. Response of isolated leg melanophores to ions is slow and irregular; NaCl, KCl, $CaCl_2$, and $MgCl_2$ all cause contraction. The hormone is sol. in water at all p_H vals. It is inactivated by alkali but cannot be reactivated by acid. Blinded animals remain constantly pale except for 2—4% of individuals which show a slight diurnal rhythm after 2 weeks. Both a black background and const. illumination tend to delay or inhibit the assumption of the pale nocturnal colour in normal animals.

A. D. H.

Thyrotropic hormone in clinical states. M. S. Jones (Endocrinol., 1939, **24**, 665—671).—Hormone added to urine can be recovered by acetone pptn. Urines from cases of myxœdema and acromegaly were assayed with negative results. V. J. W.

Comparison of guinea-pig and chick thyroid in assay of thyrotropic hormone. A. J. Bergman and C. W. Turner (Endocrinol., 1939, **24**, 656—664).—A unit is the total amount required to cause a 50% increase in the test animal's thyroid when given over 4—5 days. The guinea-pig unit is about 4 times the male chick unit. V. J. W.

Thyrotropic hormone in the pituitary of the albino rat during growth, pregnancy, and lactation. C. W. Turner and P. T. Cupps (Endocrinol., 1939, **24**, 650—655).—Assays were made by determining the effect of extracts on the thyroids of day-old chicks. Hormone concn. increased during growth and males contained twice as much as females. Concn. was especially low in œstrus and the first half of pregnancy, but high during lactation. V. J. W.

Refractoriness from pituitary thyrotropic extracts. W. C. Cutting and G. B. Robson (Endocrinol., 1939, **24**, 739—740).—Guinea-pigs become refractory to thyrotropic extracts made from old acetone-dried pituitary sooner than to extracts of fresh glands, although the immediate effects on the thyroid are the same for both. V. J. W.

Effect of thyrotropic hormone on production of adeno-carcinomata of the breast in mice. A. Lacassagne (Compt. rend. Soc. Biol., 1939, **130**, 591—593).—Injections of thyrotropic hormone did not prevent the development of adeno-carcinomata of the breast in adult mice of a strain that developed them spontaneously, nor following œstrone injections in a susceptible strain. P. C. W.

Growth-controlling hormonal substances of hypophysis. B. Lustig and H. K. Wachtel (Nature, 1939, **143**, 602).—Plant-growth factors in the hypophysis of animals were isolated and administered to rabbits and guinea-pigs. The posterior lobe extract "amicine" was found to inhibit growth. The anterior lobe extract, which stimulates animal growth, is different from the somatotropic factor of Evans.

W. F. F.

Pathogenesis of hypophyseal dwarfism. K. Apitz (Virchow's Archiv, 1938, **302**, 555—579).—The following changes were found in a 46-year old hypophyseal dwarf who died of generalised melanosarcomatosis. The anterior pituitary was smaller than normal but histologically fully differentiated. The posterior lobe was displaced into the suprasellar region and separated from the anterior lobe by a fibrosed craniopharyngeoma. The growth and proportions of the body and the development of the ossification centres corresponded with those found at the age of 14 and the epiphyseal lines with those found at 18. The testes and the sexual organs were infantile. There was presenile atrophy of several organs and osteoporosis. The separation of anterior and posterior lobes was probably the cause of dwarfism in the case described.

H. W. K.

Seasonal variations in the gonadotropic hormone content of the rabbit pituitary. M. H. Friedman and G. S. Friedman (Endocrinol., 1939, **24**, 626—630).—The content is highest in early spring and lowest in early winter. V. J. W.

Blood-cholesterol in thyroidectomised rats as related to the effectiveness of gonadotropic hormones. S. L. Leonard (Endocrinol., 1939, **24**, 679—682).—Blood-cholesterol in the rat is not affected by thyroidectomy. V. J. W.

Characterisation of gonadotropic hormones of hypophysis by their sugar and glucosamine content. H. M. Evans, H. Fraenkel-Conrat, M. E. Simpson, and C. H. Li (Science, 1939, **89**, 249—250).—Combined carbohydrate and glucosamine determinations on gonadotropic fractions of the pituitary gland distinguish between the various particular gonadotropic materials. W. F. F.

Chemical and physiological properties of gonadotropic antagonist. C. A. Bunde and A. A. Hellbaum (Amer. J. Physiol., 1939, **125**, 290—295).—The existence of a gonadotropic antagonist (first detected by Smith in 1927) is shown by the observation that in hypophysectomised rats the gonadal repair produced by pituitary transplants is prevented by intraperitoneal injections of hypophyseal extracts. This inhibition is sp. for gonadotropic hormones and does not affect the repair of thyroid or adrenal cortex. This antagonistic substance is present in unfractionated pituitary gonadotropic extracts; on fractionation it is found with the luteinising hormone. Sheep anterior pituitary preps. subjected to a high p_H lose the antagonist and the gonadotropic principles; long boiling and a low p_H destroy all the gonadotropic activity without affecting the antagonist.

M. W. G.

Gonadotropic content of hypophysis throughout life cycle of normal female rat. H. D. Lanson, J. B. Golden, and E. L. Sevringhaus (Amer. J. Physiol., 1939, **125**, 396—404).—Female rats (Sprague–Dawley strain) were studied from 14 days to 2½ years. The pooled pituitary glands of each age group were macerated, suspended in water, and assayed immediately for gonadotropic content by the uterine method on 22-day old female rats, 34—40 g. in wt. Subcutaneous doses of 0·5 c.c. each were given twice daily for 3 days; test animals were killed and ovaries

and uteri removed and the state of the vagina recorded on the 4th morning. The mean uterine wt. of each group of test animals was referred to a standard dosage–response curve and the uterine units per dose were read off. All mature rats, except the senile group, were killed in pro-œstrus. The pituitary potency rises to a peak at 21 days and decreases gradually until the onset of puberty, when there is a rapid drop in potency to half the pre-pubertal level. This pubertal level is maintaned throughout sexual life, in spite of increased pituitary size. This fact is interpreted as indicating rapid release of the gonadotropic hormone complex. Pituitary potency increases markedly at the onset of senility when the ovaries fail. M. W. G.

Anorexia nervosa ; action of anterior pituitary extracts. CONLONJOU and HÉCAEN (Encéphale, 1939, **34**, 46—51).—Amelioration of symptoms was induced in a case of anorexia nervosa by injections of anterior pituitary gonadotropic hormone. W. K. S.

Effect of removal of [anterior] lobe of pituitary on annual cycle of the male sex cells of *Bufo vulgaris*. P. REY (Compt. rend., 1939, **208**, 1116—1119).—From March to the end of autumn the testes of normal animals show spermatogenesis (all the stages simultaneously from July onwards). Hypophysectomised animals show, after 1 month, unimpaired spermatogenesis. After 2 months the spermatocytes do not form spermatozoa; after 4 months, there are degenerative changes in the spermatocytes, cessation of division of spermatogonia, and degeneration of spermatozoa formed prior to operation. J. L. D.

Chemical differences of follicle-stimulating and luteinising hormones of the pituitary. H. L. FEVOLD (J. Biol. Chem., 1939, **128**, 83—92).—Both follicle-stimulating and luteinising hormones of the anterior pituitary are pptd. by picric, picrolonic, or flavianic acid, but whereas the ppt. obtained with the former is inactive the latter retains activity. The follicle-stimulating hormone regains its activity when liberated from combination with the acid, showing that the prosthetic group reversibly combines with the pptg. reagent. The luteinising hormone is as effective when injected intraperitoneally as subcutaneously; the follicle-stimulating hormone is ineffective intraperitoneally. The luteinising hormone is measured by its action in stimulating the secretion of the interstitial cells of the testes of young male rats; the follicle-stimulating hormone is by itself inactive in this respect but augments the action of the luteinising factor. W. O. K.

Effect of trans-section of the pituitary stalk on lactation. L. HEROLD (Arch. Gynäk., 1939, **168**, 534—538).—The offspring of rats with divided pituitary stalk died from starvation as milk secretion ceased. Maintenance of normal lactation is attributed to impulses which are transmitted to the anterior pituitary via its stalk. S. SCH.

Depression of gastric secretion by anterior pituitary-like fraction of pregnancy urine. C. U. CULMER, A. J. ATKINSON, and A. C. IVY (Endocrinol., 1939, **24**, 631—637).—Injections of 1000—2000 rat units of "antuitrin-S" or 5000 units of "follutein" caused a decrease in amount and HCl of gastric juice in 4 out of 5 bitches. At 100° the extracts were inactivated in 90 min. but not in 10 min. V. J. W.

Chemistry of pressor and oxytocic hormones of pituitary. R. L. STEHLE and S. M. TRISTER (J. Pharm. Exp. Ther., 1939, **65**, 343—352; cf. A., 1936, 643).—Tyrosine, cystine, arginine, proline, and a trace of tryptophan are present in both hormones. The pressor hormone contains *iso*leucine, the oxytocic, leucine. Histidine, hydroxyproline, and glycine are absent from both. E. M. S.

Case of diabetes insipidus traumaticus and pregnancy. E. BRATTSTRÖM (Acta obstet. gynec. scand., 1938, **18**, 320—325).—Report of a case of diabetes insipidus traumaticus following a motor accident, brought on again after almost 1 year by the onset of pregnancy. M. H.

Effect of the posterior pituitary gland on exchange of sodium chloride. F. TRONCHETTI (Boll. Soc. ital. Biol. sperim., 1939, **14**, 152—153).—Posterior pituitary preps. cause transference of NaCl from the tissues to the subcutaneous interstitial fluid, and from the corpuscles to the plasma and finally increased urinary excretion of Cl′. F. O. H.

Posterior pituitary hormones and the retention of salt and water following insulin administration. A. HERZOG (Z. klin. Med., 1938, **134**, 446—466).—In diabetes mellitus, the NaCl and water retention following insulin treatment is prevented by simultaneous administration of posterior pituitary preps. Both vasopressor and oxytocic fractions are active but the latter is the better tolerated. The treatment had a favourable effect on the glycosuria and acetonuria, and had a lasting effect on the latter and on the water balance. T. S. G. J.

Effect of pituitary (posterior lobe) extract on body-water of fish and reptiles. E. M. BOYD and M. DINGWALL, jun. (J. Physiol., 1939, **95**, 501—507).—Pituitrin (0·5 to 2·0 I.U. per 10 g. body-wt.) injected into five species of fresh-water fish has no effect on the body content of water; fish hypophyses contain a substance which produces water retention when extracted and injected into frogs. Pituitrin injected into four species of reptiles produces an increase in body-water due to an inhibition of the normal water loss with probably little or no effect on the water intake. Very large doses of pituitrin stimulate water elimination in alligators to which water has been administered. J. A. C.

Effect of posterior hypophyseal extract on retention of water and salt injected into frogs. E. M. BOYD and D. W. WHYTE (Amer. J. Physiol., 1939, **125**, 415—422).—Frogs were taken out of water and 10% of their wt. of distilled water was injected into the dorsal lymph sac. Intramuscular injection of 0·5 I.U. of pituitrin per 10 g. body-wt. completely inhibits the loss of distilled water for 3 hr.; 0·2 I.U. of pitocin is equally effective and both pituitrin and pitocin are more effective than 0·2 pressor unit of pitressin. NaCl added to the injected water decreases the water-retaining power of pituitary

extracts and reverses their action when the NaCl concn. exceeds 0·7%. The optimal salt excretory dose of pituitrin is 40 times less than the optimal water retention dose. Pitressin had the greatest stimulating effect on salt excretion. M. W. G.

Vagus–post-pituitary reflex. VII. Non-eserine vagus response in different vertebrates. Y. M. Lü (Chinese J. Physiol., 1939, **14**, 9—18).—On stimulating the central end of the vagus in the snakefish, toad, turtle, chicken, duck, rabbit, and cat, a rise of arterial pressure, abolished by hypophysectomy, occurred in all (except the fish, the gland of which contained pituicytes and pressor principle). N. H.

Calorigenic efficiency of thyroid material in relation to thyroxine and to iodine content. A. E. Meyer and A. Wertz (Endocrinol., 1939, **24**, 683—692).—The efficiency of thyroid extracts cannot be exactly correlated with their content of either thyroxine or I. V. J. W.

Influence of hyperthyroidism on vitamin-*C* content of various endocrines and tissues. B. Sure and R. M. Theis (Endocrinol., 1939, **24**, 672—678).—Administration of thyroxine or deficiency of vitamin-B_1 causes a great decrease in the -*C* content of various tissues of the rat. V. J. W.

Influence of thyroid on egg production. C. F. Winchester (Endocrinol., 1939, **24**, 697—701).—Injected thyroxine partly restores egg production in thyroidectomised fowls. V. J. W.

Effect of subtotal thyroidectomy on sexual function and œstrone excretion. J. P. Laurent-Gérard and H. Welti (Compt. rend. Soc. Biol., 1939, **130**, 506—508).—6 women were operated on for hyperthyroidism. Before the operation the œstrone excretion in the urine was subnormal in 4 who also had amenorrhœa. Following the operation the menstrual cycle recommenced and the œstrone excretion was increased. P. C. W.

Influence of desiccated thyroid, thyroid concentrate, and thyroxine on the oxygen consumption of the guinea-pig. J. White, D. A. McGinty, L. P. Anderson, and F. R. White (Endocrinol., 1939, **24**, 693—696).—Thyroid concentrate made by Blum's method (elityran) was compared with dried thyroid and thyroxine in effect on the O_2 consumption of the guinea-pig. No differences were found. V. J. W.

Hyperthyroidism complicating pregnancy. R. D. Mussey (Proc. Staff Mayo Clin., 1939, **14**, 205—208).—From a review of 66 cases it is concluded that pregnancy is not an ætiological factor in hyperthyroidism. The maternal and fœtal risks depend on the degree of hyperthyroidism. Treatment should be prompt and the same as for non-pregnant cases. Pregnancy should not be interrupted. A. M. G.

Inorganic composition of normal thyroid glands, colloidal diseases of the thyroid, and hyperthyroidism. H. Meltzer and H. Heuser (Arch. klin. Chir., 1939, **195**, 543—566).—Normal thyroid glands when incinerated give an ash rich in Ca salts, some of which are combined with phosphate; sol. Mg salts are present. The colloid of the gland contains little inorg. salts, which are of the same nature as those in whole gland. Colloidal diseases of the thyroid cause an increase in the inorg. salts in parenchyma and colloid. The colloid contains little Ca salts but is rich in sol. Mg compounds and phosphates. Sex or age does not affect salt content. In fatal cases of hyperthyroidism the parenchyma and colloid contain no Mg and only traces of phosphate, and excess of Ca; in milder cases insol. Ca and Mg salts are present in large amounts in parenchyma and colloid. In "healed" cases the colloid contains little inorg. material but parenchyma approaches normal, except that Mg salts are in an insol., and phosphates in a sol., form. There is little Ca. B. W.

Goitre in school children before and after use of iodised salt. P. Lauener (Schweiz. med. Wschr., 1939, **69**, 455—458).—The frequency of goitre in school children of Canton Bern has considerably decreased since the introduction of iodised salt for cooking purposes. A. S.

Influence of ingested radioactive materials on the thyroid gland of rats. H. D. Griffith, J. T. Irving, and E. M. Mason (J. Physiol., 1939, **95**, 516—524).—Radioactive substances have no influence on the thyroid gland either when the I intake is adequate or when it is low. When the I intake is severely restricted, the I content of the thyroid gland becomes very low, colloid storage no longer occurs, and the gland exhibits marked hyperplastic changes. J. A. C.

Radioactivity and endemic goitre. H. Lederer and F. M. Messerli (Schweiz. med. Wschr., 1939, **69**, 408—411).—There is no relationship between Ra emanation content in air and endemic goitre in certain districts of Switzerland. A. S.

Chronic hyperthyroidism. II. Diffuse toxic goitre. T. O. Young (Surgery, 1938, **4**, 111—123).—55 cases of chronic hyperthyroidism in diffuse goitre are considered in relation to subjective findings, postoperative results, and pathology. The end results justify thyroidectomy in carefully selected cases. G. K. H.

Thyroid stimulation by cold; effect of changes in body temperature on basal metabolism. J. C. Ring (Amer. J. Physiol., 1939, **125**, 244—250).—Rats exposed to cold (0—5°) for short period show afterwards a rise in basal metabolism and body temp. If exposed to similar low temp. for 3 weeks the metabolic rate rose by 21% (when corr. for changes in body temp. the increase was 16%). Partial thyroidectomy prevented this rise in metabolism but removal of the superior cervical ganglion had no effect. M. W. G.

Rôle of thyroid in carbohydrate disturbance which follows hypophysectomy. S. Soskin, R. Levine, and R. E. Heller (Amer. J. Physiol., 1939, **125**, 220—226).—Adult dogs were hypophysectomised; thyroxine injected intramuscularly (½ mg. per kg. body-wt. per day) maintained a normal blood-sugar level in them throughout long periods of fasting, increased the urinary N excretion to that of fasting normal dogs, but did not diminish the hypersensitivity

to insulin. Secondary atrophy of the thyroid gland probably plays an important part in the decreased endogenous protein catabolism of the hypophysectomised animal. The nature of carbohydrate disturbance resulting from hypophysectomy is discussed. M. W. G.

Lipoid metabolism and its relation to basal metabolic rate in thyrotoxicosis. K. Inawasiro and K. Maruta (Tohoku J. exp. Med., 1939, **35**, 437—444).—Total cholesterol and cholesterol esters of blood and serum are diminished in thyrotoxicosis and return to normal vals. after treatment concurrently with the improvement of symptoms and the return of the basal metabolic rate to normal. E. R.

Effect of thyroid feeding on removal of cholesterol. L. Zon (Arch. Path., 1939, **27**, 888—894).—Thyroid feeding does not accelerate the removal of cholesterol from intracutaneous experimental deposits in the rabbit. (4 photomicrographs.) C. J. C. B.

Polyarthritis and Graves' disease. K. Veiel (Klin. Woch., 1939, **18**, 569—573).—8 cases of chronic polyarthritis accompanying Graves' disease responded to I treatment, thyroidectomy, or *X*-ray applications to the thyroid gland, but not to the usual anti-rheumatic measures. E. M. J.

Effect of thyroid feeding and thyroidectomy on the oxidation of amino-acids by rat kidney and liver. J. R. Klein (J. Biol. Chem., 1939, **128**, 659—663).—The feeding of dried thyroid gland to rats increased, and thyroidectomy decreased, the *d*-amino-acid oxidase content of the liver; that of the kidney was unchanged. A. L.

Surgical treatment of hypothyroid conditions. G. Büttner (Med. Klin., 1939, **35**, 597—599, 632—636).—A review. A. S.

Parathyroid hormone and physico-chemical equilibrium of blood-calcium and -phosphorus. I. Electrophoresis of calcium and phosphorus of serum dialysate of parathyroidectomised dogs. G. Peretti and B. Manca. **II. Electrophoresis of calcium and phosphorus of serum dialysate of dogs treated with parathyroid hormone.** B. Manca (Boll. Soc. ital. Biol. sperim., 1939, **14**, 165—166, 166—168).—I. Parathyroidectomy decreases total and diffusible serum-Ca and, generally, the content of diffusible, electronegatively charged Ca complex.

II. The content of the diffusible Ca complex shows indefinite changes whilst the electronegatively charged P complexes in the dialysate tend to diminish. F. O. H.

Parathyroid insufficiency. F. Holtz. H. Knospe. F. Klemens (Dtsch. med. Wschr., 1939, **65**, 750—752, 752—753, 753—754).—A lecture and discussion. A. S.

Primary hyperparathyroidism with renal calcification and secondary hyperplasia of the parathyroids. J. W. Johnson, jun. (Amer. J. Path., 1939, **15**, 111—128).—The case showed an adenoma of the right lower parathyroid with calcification of a horse-shoe kidney. Removal of the tumour cured the hyperparathyroidism but subsequently there developed hypertension, cardiac hypertrophy, and death in uræmia. Autopsy disclosed extensive calcification of the renal pyramids of a horse-shoe kidney, widespread arteriolar sclerosis and necrosis, arteriolar nephrosclerosis and hyperplasia of the 3 remaining parathyroid glands. (6 photomicrographs.) C. J. C. B.

Chronic iodopathic hyperparathyroidism. T. G. Drake, F. Albright, W. Bauer, and B. Castleman (Ann. int. Med., 1939, **12**, 1751—1765).—6 cases of chronic idiopathic hyperparathyroidism are described and 8 cases cited from the literature. In one fatal case the parathyroid glands were normal in size but the epithelial cells were entirely replaced by fat cells. C. A. K.

Thymus gland and Foà-Kurloff bodies. P. Redaelli and N. Nenceva (Boll. Soc. ital. Biol. sperim., 1939, **14**, 157—158).—During hypertrophy or hyperfunction of the thymus (guinea-pig) (*e.g.*, following injection of human urine of pregnancy), the presence of thymo-lymphocytes containing Foà-Kurloff bodies was observed. F. O. H.

Rôle of the thymus in immunisation. J. A. Hammar (Z. mikr.-Anat. Forsch., 1938, **44**, 425—450).—3-Months' old rabbits were immunised against *B. paratyphosus* and the titres measured. Similar tests were done on animals from which the thymus had been removed. Counts and measurements of the lymphoid tissue, the Hassall's corpuscles, and the vitamin-*C*-granule content were made in the thymus of the control animals and the immunised unoperated animals, and compared with the same counts in the spleen, lymph nodes, and gonads in the thymectomised animals. There was a slight but statistically uncertain decrease in the titre after thymectomy, and the increase of lymphoid tissue of other organs in response to immunisation was slightly less after thymectomy. The -*C* changes were even more indefinite. The thymus may thus slightly improve immunity. J. H. G.

Local lipoid atrophy and lipoid dystrophy [after insulin]. B. Alpert and E. A. Ferguson (Endocrinol., 1939, **24**, 741—743).—32 out of 430 insulin-treated patients developed atrophy of the subcutaneous fat at the sites of injection. V. J. W.

Increased blood-lipins and -ketones during insulin hypoglycæmia. P. Merlo (Boll. Soc. ital. Biol. sperim., 1939, **14**, 154—155).—Following insulin dosage sufficient to bring the blood-sugar (normal or diabetic) to 0·030—0·035%, the blood-lipins (mainly total cholesterol and phosphatides) and -ketones (acetone and acetoacetic and β-hydroxybutyric acids) are increased. F. O. H.

[Islets of] pancreas of white rats of different age groups. W. N. Hess and C. W. Root (Amer. J. Anat., 1938, **63**, 489—498).—Pancreatic islets were counted after neutral-red injection in rats from 1 to 256 days old. The no. of islets, wt. of pancreas, and body-wt. increase rapidly for 36 days and then more slowly. The no. of islets per unit wt. of pancreas, or per unit body-wt., decreases rapidly for 36 days and thereafter there is a slight decrease; the proportionate no. of islets to acinar tissue and to body-wt. is the same in both sexes. In rats of the same age, those

with pancreases lighter than average have a larger no. of islets per unit wt. of pancreas than those with a heavier gland. H. L. H. G.

Distribution of vitamin-*C* in the adrenal gland of mouse ; nature of *X* zone. C. P. Leblond and W. U. Gardner (Anat. Rec., 1938, **72**, 119—129).—Injections of 10% $AgNO_3$ showed that, while no reaction occurred in the zona glomerulosa or in the medulla of the mouse adrenal, the *X* zone had a power of reduction comparable with that of the zona fasciculata and the zona reticularis. Hence the *X* zone is of cortical nature, and it contains active ascorbic acid. H. L. H. G.

Insulin hypoglycæmia. II. Behaviour of blood gases in relation to hypoglycæmic state. III. Glycorrhachia and hypoglycæmia. E. F. Rosenberg (J. Lab. clin. Med., 1939, **24**, 809—814, 815—820).—II. The development of the hypoglycæmic state is associated with a marked increase in the concn. of O_2 in the venous blood, which reaches vals. usually found in arterial blood. The blood has a greater O_2-carrying power during hypoglycæmia than normal. In 1 instance a slight but steady fall occurred for the val. for CO_2 content of venous blood.

III. Lowering of the blood-sugar level following insulin is accompanied in man by a corresponding but slower fall in the level of the c.s.f.-sugar, while administration of carbohydrate to a hypoglycæmic patient causes a rapid rise in blood- and a slower rise in the c.s.f.-sugar. Administration of insulin had no effect on the levels of Cl or protein in c.s.f. or caused change of pressure. C. J. C. B.

Pathological changes in heart, skeletal musculature, and liver in rabbits treated with insulin in shock dosage. J. Tannenberg (Amer. J. Path., 1939, **15**, 25—54).—Repeated shock doses of insulin produced hydropic changes in the cardiac and skeletal musculature even when no convulsions were elicited. Only in exceptional cases did the changes progress to necrosis. Individual rabbits varied greatly in sensitivity. 2 types of liver reaction were noted which were independent of the size of the dose : (1) the liver was able to release gradually its glycogen, and in these cases the blood-sugar was comparatively well maintained and convulsions and damage to organs were delayed ; (2) the liver retained its glycogen, particularly in the centre of the lobules, and convulsions and pathological changes were rapid. (23 photomicrographs.) C. J. C. B.

Improvements in accuracy of insulin assay on white mice. A. M. Hemmingsen (Skand. Arch. Physiol., 1939, **82**, 105—112).—Insulin was assayed in white mice at a room temp. of 25°. The mortality rate was reduced from 12 to 0·3%. The standard deviation of accuracy in a test on 160 mice was reduced from 12—25 to 7—10% by using control and experimental groups of animals for repeated tests and changing alternately both groups. A. S.

Decreased resistance to hypoglycæmia on successive days of administration of insulin. W. C. Corwin (Amer. J. Physiol., 1939, **125**, 227—233).—When a non-diabetic dog is given injections of insulin on succeeding days (1 unit per kg. body-wt. every 2 hr. until convulsions occur), the convulsions occur earlier on the 2nd day and still earlier on the 3rd ; the resistance to insulin then becomes more or less stabilised so that on all succeeding days there is little if any variation in the response. The curve of the blood-sugar on the 1st day does not differ in any way from that on succeeding days. Changes in tolerance to α-glucose, glycogen content of the liver, inorg. PO_4''' or K of serum do not account for the phenomenon. M. W. G.

Mode of action of insulin on body temperature. R. Okumura (Folia pharm. japon., 1939, **26**, 107—108).—In rabbits, 1—3 units of insulin per kg. reduce the blood-sugar and body temp. The max. fall of the blood-sugar occurs earlier than the max. fall of body temp. Glucose inhibits the fall of blood-sugar and of body temp. Adrenaline has no effect on the action of insulin on the body temp., but is antagonistic to its action on the blood-sugar. Chloral hydrate and morphine increase the blood-sugar and lower the body temp., but combined with insulin they decrease its action on the blood-sugar and body temp. Luminal and veronal increase the action of insulin on the body temp. The combination of the above mentioned drugs with insulin never produced convulsions. E. R.

Hypoglycæmic reactions in diabetes. D. Adlersberg and H. Dolger (Ann. int. Med., 1939, **12**, 1804—1815).—Medico-legal problems are discussed. C. A. K.

Tolerance and toxicity of insulin. F. M. Allen (Ann. int. Med., 1939, **12**, 1870—1885).—Protamine–Zn–insulin is more toxic than regular insulin in rats, rabbits, and cats under various dietetic conditions. C. A. K.

Reactions of ammonolysed insulin. R. G. Roberts (J. Biol. Chem., 1939, **128**, 597—602 ; cf. A., 1934, 638).—The curves of H_2 evolution obtained on adding Na to insulin in liquid NH_3 are similar to those obtained with caseinogen, ovalbumin, edestin, and silk fibroin, the extent of reduction resembling especially that found for ovalbumin. No prosthetic group with a catalytic effect on the reaction (*e.g.*, as in hæmatin) occurs in insulin. The solubility of cryst. insulin in NH_3 is not affected by drying at 80°, and contact with NH_3 causes no inactivation. Insulin, like hæmatin, forms a ppt. with glycine in NH_3. A. L.

Modern diabetes therapy. R. Boller (Wien. klin. Wschr., 1939, **52**, 441—445).—A lecture. A. S.

Experiences with depot insulin. E. Kestermann and T. Schleinig (Med. Klin., 1939, **35**, 567—569).—5 out of 90 patients with a carbohydrate intake of 200 g. per day required a second injection of protamine–Zn–insulin in the evening after administration of 40—60 units in the morning. Hypoglycæmic symptoms become more slowly apparent than after administration of insulin. The insulin requirements of the patients decrease after treatment with protamine–Zn–insulin. 1 patient showed allergic reaction. Depot insulin HS10 and surfen are not so well tolerated as protamine–Zn–insulin. A. S.

Clinical experiences with depot insulins. P. Gottlebe (Klin. Woch., 1939, **18**, 485—489). E. M. J.

Comparative action of various depot insulins. P. Martin (Z. ges. exp. Med., 1939, **105**, 599—606).—The blood-sugar-lowering action of various depot insulin preps. was tested in rabbits. A. S.

Effects of ovariectomy on the adrenal glands of the albino rat. C. M. Blumenfeld (Endocrinol., 1939, **24**, 723—738).—36 rats were spayed shortly after weaning. In 21 killed at the age of 3 months the adrenal cortex weighed 9·5% less than in controls. In 15 killed at 6 months the cortex weighed 35·8% less than in controls. The medulla was unaffected and the loss of cortex was due to a reduction in size of the cells of the zona fasciculata. V. J. W.

Acute insufficiency of adrenal glands. A. L. Burger and H. Fink (Ann. int. Med., 1939, **12**, 1583—1591).—2 cases, rapidly fatal, are described. Autopsy showed extensive tuberculous disease of the adrenal glands. C. A. K.

Waterhouse–Friderichsen syndrome [hæmorrhage into the adrenal gland]. S. A. Levinson (J. Pediat., 1939, **14**, 506—516).—Hæmorrhage into the adrenal glands is accompanied by a sudden onset of malaise, vomiting, diarrhœa, fever, rapid pulse, cyanosis, purpuric spots on the skin, lethargy, and coma with death in 24—48 hr. A case with autopsy is described. (3 photomicrographs.) C. J. C. B.

Sodium factor of the adrenal. F. A. Hartman, H. J. Spoor, and L. A. Lewis (Science, 1939, **89**, 204).—Repeated extraction with ethyl ether separates the Na factor from cortin. The two factors have been demonstrated by administration to adrenalectomised male cats and female dogs. The cortin-treated animals show a typical untreated adrenalectomy picture as regards Na metabolism but are normal in other ways, and do not die. The addition of the Na factor maintains the animals in the usual way. W. F. F.

Effects of deoxycorticosterone acetate and cortin on salt elimination. H. W. Dryerre (Brit. Med. J., 1939, I, 971—973).—The effects of the acetate and cortin on urinary Na elimination were studied in a case of Addison's disease who was given a high-K low-NaCl diet. Both increased blood-Na and -Cl; the acetate had a prolonged action when implanted as tablets into the abdominal wall. C. A. K.

Parasympathetic nerve supply of the adrenals. B. Hasama (Z. ges. exp. Med., 1939, **105**, 463—471).—Stimulation of the vagus in the neck or intravenous injection of eserine or pilocarpine increases the electrical potentials obtained from the adrenals and the secretion of adrenaline (estimated in cava blood by Kodama's method) in rabbits; light adaptation of the retinal pigment was observed in toads kept in darkness. Double splanchnicotomy or administration of ergotamine reduces the potentials following pilocarpine or eserine injection. A. S.

Adrenal cortex, anterior pituitary, and thyroid gland. E. Schulze and K. Mellinghoff (Z. ges. exp. Med., 1939, **105**, 532—539).—The thyrotropic hormone content of the anterior pituitary is diminished, and the thyroid gland is inactive, in adrenalectomised guinea-pigs; these effects were not observed if cortidyn and redoxon were administered. The thyrotropic hormone content of the anterior pituitary of normal guinea-pigs is increased by cortidyn and redoxon; the thyroid is activated. A. S.

Compensatory action of fœtal adrenals during pregnancy in adrenalectomised dog. F. Billmann and R. Engel (Klin. Woch., 1939, **18**, 599—600).—An adrenalectomised dog required no treatment during the 2nd half of pregnancy. A crisis with fatal outcome set in 36 hr. after the birth of 6 puppies. E. M. J.

Epinephrine load of the adrenal gland of atropinised rabbits. N. Sazawa (Tohoku J. exp. Med., 1938, **34**, 277—288).—This was slightly decreased after large doses of atropine. The rabbits used were put under the influence of atropine (35—135 mg. per kg.) for 5 min. to 5 hr. F. Ja.

Epinephrine output rate after atropine. H. Sato, M. Hatano, and T. Muto (Tohoku J. exp. Med., 1938, **34**, 289—300).—In dogs after intravenous injection of atropine (5—10 mg. per kg.) the output of adrenaline was slightly increased for 1 hr.; parallel with it there was a rise in blood-sugar. F. Ja.

Action of atropine on epinephrine secretion caused by morphine or insulin. H. Sato, T. Muto, and M. Hatano (Tohoku J. exp. Med., 1938, **34**, 393—402).—The increased output of adrenaline caused by an injection of morphine or insulin in dogs is not affected by a preceding atropine injection. F. Ja.

Influence of atropine on reduction of epinephrine content of adrenal gland due to certain agencies. N. Sazawa (Tohoku J. exp. Med., 1938, **34**, 470—480).—In rabbits atropine had no influence on the reduction of the adrenaline content of the adrenal glands caused by splanchnic stimulation, bleeding, or insulin. F. Ja.

Slow epinephrine in treatment of chronic asthma. J. A. Murphy and C. A. Jones (J. Allergy, 1939, **10**, 215—219).—The no. of injections of adrenaline for relief of chronic asthma is reduced by using slow adrenaline (adrenaline in peanut oil). C. J. C. B.

Slowly absorbed gelatin–epinephrine mixture. W. C. Spain, M. B. Strauss, and A. M. Fuchs (J. Allergy, 1939, **10**, 209—214).—The prep. of a 1 : 500 gelatin–adrenaline mixture which is slowly absorbed, non-toxic, non-antigenic, and readily administered is described. C. J. C. B.

Dehydrogenation of glyceraldehyde by adrenaline. W. Seitz (Z. ges. exp. Med., 1939, **105**, 559—576).—Minute concns. of adrenaline (0·1 μg.) and related substances (stryphnon, sympatol, veritol, ephetoxin, benzedrine) accelerate the decolorisation of methylene-blue by glyceraldehyde. Lactoflavin, ascorbic acid, glutathione, cysteine, and thyroxine have no such action. The adrenaline effect occurs at p_H 7·0—10·0; it is accelerated on the alkaline side;

the redox potential is approx. 250 mv. Glyceraldehyde, as donator, can only be replaced by methylglyoxal. Oxidised adrenaline, which has no action on blood pressure, is still an active catalyst. Adrenaline, after dehydrogenation, is still a pressor substance. Addition of KCl, $NaHCO_3$, and $K_4Fe(CN)_6$ sensitises the system so that 0·1 mμg. of adrenaline is still active. A. S.

Relation between the epiphysis cerebri and the reproductive system. S. Abd-el-Malek (J. Anat., Lond., 1939, **73**, 419—423).—In adult female rats implantation of infantile epiphyses does not arrest their œstrous cycles in dicœstrus, nor influence the œstrous cycle. E. E. H.

Discussion on the pineal gland. A. G. Mitchell. E. Boyd. W. E. Chamberlain. N. H. Einhorn. H. F. Helmholz. A. H. Spohn (J. Pediat, 1939, **14**, 534—555). C. J. C. B.

(xii) REPRODUCTION.

Energetics of differentiation. VII. Respiratory rates of parthenogenetic and fertilised *Urechis* eggs. A. Tyler and N. H. Horowitz (Biol. Bull. Woods Hole, 1938, **74**, 99—107).—The initial O_2 consumption of fertilised and parthenogenetic eggs is similar but the subsequent rise in respiratory rate is slower in the latter than in the former. Parthenogenetic eggs which develop without cleavage increase their O_2 consumption more slowly than those which cleave. Phenylurethane inhibits cleavage in fertilised eggs and slows down but does not arrest nuclear division. In such eggs the initial respiratory rate is unaltered but the subsequent rise is slower. It is concluded that the rate of increase of O_2 consumption in these cases is correlated with the rate of development. Artificial parthenogenesis with or without cleavage was induced by treatment of unfertilised eggs with NH_3 in sea-water. Parthenogenetic eggs develop more slowly than fertilised. A. D. H.

Oxygen consumption of artificially activated and fertilised *Chaetopterus* eggs. J. Brachet (Biol. Bull. Woods Hole, 1938, **74**, 93—98).—Comparison is made between the O_2 consumption of fertilised eggs and that of eggs differentiating without cleavage as the result of artificial activation by treatment with KCl. Fertilisation and artificial activation cause a nearly equal initial fall in O_2 consumption. The subsequent rise is more rapid in the fertilised eggs. The fertilised eggs developed more quickly than the artificially activated eggs and showed a more rapid synthesis of thymonucleic acid. A. D. H.

Inactivation of sperm by *X*-radiation in *Habrobracon*. J. Maxwell (Biol. Bull. Woods Hole, 1938, **74**, 253—255).—Treatment of the males of this wasp with 41,000 r. causes complete sterility due to production of dominant lethal factors in the sperm. Treatment with 142,000—143,000 r. causes partial inactivation of the sperm. A. D. H.

Physiology of reproduction of *Ostrea virginea*. I. Spawning reactions of the female and male. P. S. Galtsoff (Biol. Bull. Woods Hole, 1938, **74**, 461—468).—Eggs are discharged from the oviducts into the suprabranchial chamber and the cloacal aperture is closed. They pass into the pallial chamber owing to the difference of pressure on the two sides of the gill which is increased when the valves open. The eggs are expelled from the pallial chamber through a small opening between the mantle folds, equidistant between the mouth and the cloaca. Expulsion is carried out by the action of the adductor muscle which contracts rhythmically and maintains a steady level of tonus in contrast to its irregular behaviour at other times. This type of behaviour of the muscle cannot be produced experimentally and is not due to the presence of eggs in the pallial chamber as it continues after these have been expelled. In the male, sperm pass into the suprabranchial chamber and are carried out of the cloaca by the water current. Muscular contractions play no part in the latter part of the process. Muscles in the wall of the vas deferens probably control the discharge of sperm into the suprabranchial chamber. A. D. H.

Adelphophagy in *Pisania maculosa* (Lmk). A. Franc (Compt. rend. Soc. Biol., 1939, **130**, 652—654).—The ovules of this Prosobranch are deposited in a capsule. The ovules are all similar in appearance but only a few of them develop into larvæ, which then ingest the remaining ovules. P. C. W.

Sexual cycle in the female toad, *Bufo arenarum*. I. L. C. de Allende (Compt. rend. Soc. Biol., 1939, **130**, 676—679).—The cycle can be divided into 3 phases: (1) repose during autumn and winter; (2) activity during spring with ovulation and laying of eggs leaving the ovary and oviduct exhausted, and (3) recuperation during summer when ovary and oviduct again become mature. The whole of the 2nd phase is controlled by the anterior hypophysis since the sex hormones are without effect. P. C. W.

Effects of testosterone propionate on sex differentiation in *Amblystoma*. R. K. Burns, jun. (Anat. Rec., 1939, **73**, 73—93).—Larvæ of *A. punctatum* were injected with testosterone propionate in small doses until control animals showed incipient metamorphosis. The gonads were unaffected in genetic males; ovaries showed cortical inhibition and a varying amount of medullary (testicular) development, though no complete reversal was seen. The mesonephric ducts were greatly hypertrophied; the oviducts aborted; the vasa efferentia were unaffected, and there was a massive enlargement of the cloaca in both sexes. (3 plates.) H. L. H. G.

Effects of œstrone on sex differentiation in *Amblystoma*. R. K. Burns, jun. (Anat. Rec., 1938, **71**, 447—467).—Small doses of œstrone were injected into the body cavity of the larvæ at 3- or 4-day intervals for 50—60 days. Genetic females were unaffected and ovarian development was not accelerated; genetic males showed varying degrees of sex reversal in the testes; development of the rudimentary oviduct was stimulated regardless of sex. Œstrone acts directly on the oviduct; its action on the gonad may be primarily on the rete apparatus with resulting suppression of medullary development. H. L. H. G.

Sex reversal in *Amblystoma*. Reversal in *A. tigrinum* females induced by ectopic implantation of testis preprimordia. R. R. Humphrey (Anat. Rec., 1938, **72**, 451—467).—Ectopic transplants of the gonad preprimordium of *Amblystoma* were made into the pronephric region of normal *Amblystoma* embryos. Exploratory operations were carried out at intervals to determine macroscopic changes in the gonads. In 64% of female hosts with testicular grafts, extensive reversal, shown by lobule development, occurred before the end of a year; the remainder showed germ cells and rete tubules in the medullary region and relative cortical sterility of the ovaries. (1 plate.) H. L. H. G.

Effect of *X*-, *γ*-, and β-rays on fertilised eggs of sea-urchins. H. Yamashita, K. Mori, and M. Miwa (Gann, 1939, **33**, 117—121).—*X*-, *γ*-, and β-Rays caused a delay in cleavage time when the nucleus was in the early prophase. E. B.

Amphibian gametes as biological test material. R. Rugh (Science, 1939, **89**, 302).—Eggs and spermatozoa from frogs, stimulated by pituitary extracts, were used for irradiation investigations with *X*-rays. The sperm is very much more sensitive than the inseminated egg, as judged by subsequent development. W. F. F.

Germinal hermaphroditism in man. R. Raynaud, F. G. Marill, and R. Xicluna (Compt. rend. Soc. Biol., 1939, **130**, 655—657).—A case is described having male genitalia on the left side and female on the right. Secondary characteristics were mixed. Both ovary and testis at biopsy were functionally normal. P. C. W.

Growth processes in cartilage and bone subsequent to gonadectomy and administration of anterior pituitary extract of cattle in immature male and female guinea-pigs. M. Silberberg and R. Silberberg (Amer. J. Path., 1939, **15**, 55—72).—In immature guinea-pigs gonadectomy causes an increased proliferation of the euhyaline cartilage in various cartilaginous tissues. In males hyperplastic growth is more accentuated, whereas in females hypertrophy is more pronounced, causing anthropathic lesions more frequently. A combination of acid extract of anterior pituitary of cattle and of castration leads to summation of effect. (10 photomicrographs.) C. J. C. B.

Enzymic biochemistry of sex hormones. L. Mamoli (Österr. Chem.-Ztg., 1939, **42**, 190—194).—The hydrogenation and dehydrogenation of the sex hormones effected by yeasts and bacteria are reviewed. F. O. H.

Therapeutic use of sex hormones. H. Albrecht (Münch. med. Wschr., 1939, **86**, 641—644, 693—696).—A lecture. A. S.

Hypergenitalism in children. I. P. Bronstein (J. Pediat., 1939, **14**, 203—212).—A mentally retarded boy is described, with precocious sexual development exhibiting no spermatogenesis, premature ossification, or epiphyseal union. Hydrocephalus was not present. The patient excreted excess of prolan. C. J. C. B.

Ageing and menopause in women. F. Kovács (Z. Geburtsh. Gynäk., 1939, **118**, 285—303).—A review. S. Sch.

Mode of action of female sex hormones. F. Kovács (Mschr. Geburtsh. Gynäk., 1938, **108**, 93—124).—A lecture. S. Sch.

Vegetative and generative ovarian function. K. Tietze (Klin. Woch., 1939, **18**, 577—580).—A review. E. M. J.

Structure of rat ovaries under varying conditions. J. Freud and A. Vedder (Acta neerland. Morph., 1938, **2**, 71—83).—300 rat ovaries were examined; they included normal infantile, adult, pregnant, and puerperal rats, as well as animals subjected to hypophysectomy, injection of pituitary extracts, artificial extra-uterine pregnancy, extirpation of fœtuses with or without placentæ, and removal of corpora lutea during pregnancy. Two factors are involved in follicular growth; one acts until the ovum has reached its full size, the other causes thereafter full Graafian development. After hypophysectomy the Graafian follicles degenerate and disappear. Corpora lutea of pregnancy may be derived from old corpora lutea as well as from the follicles which have yielded the fertilised ova; they persist after hypophysectomy; the presence of living fœtuses is important in maintaining them. Pregnancy does not interrupt the follicular cycle. (12 figs.) H. L. H. G.

Pathogenesis of follicular cysts of the ovary. C. Diaca (Virchow's Archiv, 1938, **302**, 580—606).—The ovaries of 99 girls up to 16 years of age were examined. Follicular cysts were found in 20 cases of newly-born including premature babies, infants, and girls before puberty. Maturation of follicles is a normal process in the newly-born while cyst formation is pathological. The view that these cysts are caused *in utero* by the hormones of the mother is supported by injections of large doses of an extract from serum of pregnant mares into pregnant guinea-pigs. In these experiments there was a high incidence of abortion, particularly when the prep. was injected during early pregnancy. There was an enlargement and hyperæmia of the fœtal uteri and ovaries; maturing of the ovaries was found with formation of secondary follicles, Graafian follicles, cysts, and corpora lutea atretica. In rats and rabbits large doses of the extract always caused abortion, as did large doses of prolan in guinea-pigs. H. W. K.

Œstrogenic action of sage (*Salvia officinalis*). S. Kroszczynski and M. Bychowska (Compt. rend. Soc. Biol., 1939, **130**, 570—571).—A benzene extract of sage was toxic to immature female mice. When purified with ethyl acetate and light petroleum and injected it had all the effects of œstrone. The extract of 1 kg. of dried sage was equiv. in activity to 6000 I.U. of œstrone. P. C. W.

Masculinising tumour in hen. G. Krediet (Acta neerland. Morph., 1938, **2**, 48—61).—A hen which had acquired the external characters and habits of a cock was found post-mortem to have a large tumour replacing the ovary, and many smaller cystic tumours scattered over the peritoneum; they

were epithelial neoplasms which all arose from the peritoneum. The relationship between zygotic intersexuality, the tumours, and the appearance of masculinisation is discussed; it is concluded that the tumours are not the primary cause of the masculinisation, but that zygotic intersexuality is the determining factor. H. L. H. G.

Masculinising tumour of the ovary. A. Rottino and J. F. McGrath (Arch. intern. Med., 1939, **63**, 686—710).—2 cases of primary masculinising tumour of the ovary (masculinovoblastoma) are described, one of which was malignant. The tumours are composed of large yellow or orange cells and probably arise from adrenal rests; they are distinct from the arrhenoblastoma and the feminising luteoma. 7 other cases from the literature are also discussed. C. A. K.

Protective action of the ovary against tumour production. A. Lipschutz and L. Vargas (Compt. rend. Soc. Biol., 1939, **130**, 596—599).—Female guinea-pigs were injected continuously over a long period with œstradiol benzoate. All developed tumours. The guinea-pigs did not develop tumours so constantly or intensely if they were ovariectomised before treatment. If the treatment was sufficiently prolonged the ovary no longer had any protective action. P. C. W.

An egg cell hormone. E. Klar (Klin. Woch., 1939, **18**, 600—601).—An extract from fish roe produced premature parturition in mice and rabbits; the substance behaves chemically like a protein and one similar in action was occasionally found in the urine of menstruating women. E. M. J.

Action of follicle hormone combined with testosterone propionate in ovariectomised rats. E. Steinkamm and H. Meckies (Arch. Gynäk., 1939, **168**, 436—444).—Ovariectomised rats were treated with œstradiol benzoate combined with testosterone propionate in the ratio of 1 : 250 to 500. The vaginal œstrous reaction did not occur; the vagina became lined by a secreting columnar epithelium. Similar changes were found in the lower part of the cervix. S. Sch.

Effect of œstrogenic hormone on experimental tuberculosis. L. A. Gray and C. B. Brack (Endocrinol., 1939, **24**, 645—649).—Œstrogenic doses of "progynon-B" had no effect on either the natural or the acquired resistance of the female guinea-pig to injected tubercle bacilli. V. J. W.

Œstrogenic substances. K. Pedersen-Bjergaard (Dansk Tidsskr. Farm., 1939, **13**, 114—124).—A review. M. H. M. A.

Effect of œstrogenic hormone and ovariectomy on the normal antibody content of the serum of mature rabbits. L. Weinstein (Yale J. Biol. Med., 1939, **11**, 169—178).—Œstrogenic hormone produces an increase in the amount of circulatory agglutinin for *E. coli* and hæmolysin for sheep erythrocytes in mature male and female rabbits; the degree of change is proportional to the amount of hormone. Small doses produce an increase in hæmolysin but no change in agglutinin. Ovariectomy in mature rabbits causes a decrease and subsequent large increase in serum-agglutinin level; the hæmolysin level also rises. These changes may be related to gonadotropic hormone; there is some evidence that the effects produced by ovariectomy are not due to uterine infection. A. G. M. W.

Effect of œstradiol monobenzoate on gonads, endocrine glands, and mammæ of lactating rats. P. Bacsich and S. J. Folley (J. Anat., Lond., 1939, **73**, 432—440).—High daily doses of œstradiol benzoate (rats) caused enlargement of the pituitary with hyperæmia and hæmorrhage and increase of chromophobe cells, and also diminution in size and activity of the thyroids; ovariectomy had no effect on these changes. In addition there were hyperæmia and degeneration in the adrenal cortex, and also an increase in the size and no. of corpora lutea. Lactation was inhibited, but there was no mammary involution. E. E. H.

Changes in water content of organs and tissues by œstradiol. S. Zuckerman and G. Bourne (Nature, 1939, **143**, 521—522).—Œstrogenic stimulation causes a widespread change in water balance throughout the body. W. F. F.

Variations in response of ovariectomised mice to œstrone. C. W. Emmens (Nature, 1939, **143**, 476—477).—The variations in response are greater than are shown to occur by alteration of the temp. and lighting of the environment. W. F. F.

Action of follicular hormone on the breast after dividing pituitary stalk. L. Herold and G. Effkemann (Klin. Woch., 1939, **18**, 455—456).—60 daily intramuscular injections of 200 to 250 I.U. of follicular hormone failed to produce any mammary changes in male rats after severing the pituitary stalk. E. M. J.

Action of follicle hormone on the glycogen content of vaginal epithelium in children. K. Herrenberger and F. H. Horstmann (Arch. Gynäk., 1939, **168**, 451—458).—The threshold oral dose of œstradiol benzoate which produces glycogen storage in the infantile vaginal epithelium is 1000 units per day for 4 days. The glycogen disappears 2—3 weeks after discontinuing daily injections of 5000 units of the benzoate for 5—7 days. S. Sch.

Persistence of œstrogens in the blood after the menopause. E. Shute (Endocrinol., 1939, **24**, 744—745).—55 out of 82 post-menopausal subjects showed a high level of blood-œstrogen on one or more occasions. V. J. W.

Termination of pregnancy of dogs by gonadotropic antihormone. K. W. Thompson (Endocrinol., 1939, **24**, 613—616; cf. Physiol. Abstr., 1937, **22**, 416).—Serum of a dog, which had been injected for 3½ years with gonadotropic sheep's pituitary extract, caused abortion in 13 pregnant bitches on intravenous injection. V. J. W.

Treatment of repeated miscarriage. Bickenbach (Med. Klin., 1939, **35**, 501—504).—Women suffering from repeated miscarriage were successfully treated with corpus luteum hormone and vitamin-*E* (2 tablets of the Promonta prep. 3 times per day). A. S.

Uterine hæmorrhage induced by pregneninonol. B. Zondek and S. Rozin (Lancet, 1939, **236**, 504).—Uterine bleeding was induced by oral pregneninonol (progesterone-like substance) in a normal woman during the intermenstrual stage, and in a woman with secondary amenorrhœa, without preliminary treatment with œstrogenic hormone. The dose was 6 times the effective intramuscular dose of progesterone. (Cf. A., 1939, III, 383.) C. A. K.

Progesterone and the nasal mucosa. J. K. W. Pepper and H. Royle (Brit. Med. J., 1939, I, 974—975).—A case of spasmodic rhinorrhœa with menorrhagia was successfully treated with progesterone. C. A. K.

Action of hormones and vitamins in pregnant rodents. K. Ehrhardt and W. Koenig (Klin. Woch., 1939, **18**, 308—311).—Large doses of corpus luteum hormone (5—10 mg.) given to the pregnant mouse and of testosterone (10 mg.) to the rat cause intrauterine fœtal death with maceration or absorption; lower dosage may kill only part of the fœti, but those born do not long survive. High doses of vitamin-*A*, -*B*, -*C*, and -*H* cause partus praematurus. E. M. J.

Quantitative inhibition of œstrone by progesterone in the baboon. J. Gillman and H. B. Stein (Nature, 1939, **143**, 559).—An increase in sensitivity to progesterone is found with ascent of the phylogenetic scale. W. F. F.

Blood-vessels of uterus under normal conditions and in myoma. B. Holmgren (Acta. obstet. gynec. scand., 1938, **18**, 192—213).—The distribution of the vessels in normal uteri and adnexa from adults, children, and fœtuses, as well as their development in different types of uterine myomata, were studied by *X*-ray photographs. The blood supply of the tubes is best developed in their ampullary portion. Marked sinuosity is typical of the vessels in the interior female genitalia both in normal conditions and in myoma. The correlation between different types of necrosis and the vascularisation of the myomata is also given. M. H.

Uterine motility cycle in guinea-pig. K. A. Greig (Amer. J. Physiol., 1939, **125**, 547—550).—The mobility of the excised guinea-pig uterus is decreased during the luteal phase. A slight increase (3—6 mg.-%) of $CaCl_2$ in the bath fluid completely masked the progesterone-induced quiescence; the response of the uterus to a near threshold dose of pituitrin (0·001 unit per 100 c.c. of bath) was diminished by a small reduction of $CaCl_2$. M. W. G.

Cases of metropathia hæmorrhagica and secondary amenorrhœa treated with gonadotropic hormone. R. Rydberg (Acta. obstet. gynec. scand., 1938, **18**, 1—23).—2 cases of metropathia hæmorrhagica and 4 cases of secondary amenorrhœa were treated with urinary gonadotropic hormone ("physex"). In the 2 cases of metropathia the endometrium after treatment was in the secretory stage. The 4 cases of amenorrhœa received a protracted treatment of 500 M.U. of "physex" twice a week. 2 out of these 4 cases had previously had large doses of œstrin and one of these had also a short treatment with luteohormone. The ovarian hormones caused proliferation of the endometrium, as well as bleedings, but no true menstruation. After treatment for several weeks with "physex" all 4 patients had bleedings of menstruation type and samples of endometrium, taken while bleeding occurred, showed it was in the secretory state. In 3 of the treated patients regular monthly bleedings ensued. M. H.

Pharmacology and toxicology of synthetic œstrogenic substances. A. Loeser and K. Erbacher (Z. ges. exp. Med., 1939, **105**, 430—446).—Daily subcutaneous injection of 1 mg. of diethylstilbœstrol into rats produces subconjunctival and nasal hæmorrhages on the 12th—16th day. Growth is retarded and O_2 consumption temporarily diminished. The lethal intravenous dose in rabbits is 40—50 mg. Injection of stilbœstrol into the guinea-pig's uterus produces hypertrophy of the uterine muscle fibres and proliferation of the mucous membrane after 24 hr., as after administration of œstrone, œstradiol, or œstradiol monobenzoate. It has no action on the thyroid on intrauterine administration, thus differing from œstradiol. Prolonged administration of large doses of stilbœstrol produces epithelial cornification in uterus and vagina. Adenoma of the mammary glands were not observed. If given during pregnancy, the fœtus dies. The pituitary is enlarged, but contains less thyrotropic and gonadotropic hormones. The ovaries contain maturing follicles and corpora lutea. The thyroid gland is inactive. Toxic changes occur in the adrenal cortex and in the liver. Liver-glycogen is diminished and the cells store fat. Serum-bilirubin is increased and uribilinogen is found in the urine. Stilbœstrol, on intravenous injection (0·5—5 mg) in cats, lowers blood pressure. Respiration is unaffected. Concns. of 1 : 500,000—1 : 20,000 inhibit the contractions of the isolated rabbit's small intestine. Concns. of 1 : 100,000—1 : 10,000 stimulate slightly the contractions of the isolated guinea-pig uterus. A. S.

Synthetic œstrogenic compounds related to stilbene and diphenylethane.—See A., 1939, II, 312.

Roentgen studies of mechanism involved in sperm transportation in female rabbit. R. H. Krehbiel and H. P. Carstens (Amer. J. Physiol., 1939, **125**, 571—577).—Transfer of methylene-blue, Janus-green B, and iodochlorol through the reproductive system of œstrous rabbits was observed after artificial stimulation of the vulva. These dyes reach the tubal end of the uterine horns 2—5 min. after the onset of stimulation; this transportation is brought about by the action of the vaginal and uterine musculature. The fluids must be placed above the vaginal sphincter, the closure of which creates a closed tube. Subsequent contractions of the vagina cause a churning of the contained liquid, which is forced to the ora of the cervix and is under pressure at this point periodically. The observed transfer of fluids through the uterus may be similar to the transfer of spermatozoa. M. W. G.

Treatment of dysfunctional uterine bleeding with testosterone propionate. C. Mazer and M.

MAZER (Endocrinol., 1939, **24**, 599—602).—Doses of 2·5—25 mg. 3 times weekly caused benefit with no undesirable results in 68% of cases. V. J. W.

Hypophysis syndrome in young female guinea-pigs after testosterone, and fate of unripe ova. V. DANTSCHAKOFF (Z. Zellforsch., 1939, **29**, 214—226).—Testosterone prevented the onset of pregnancy. 3—4 weeks after the cessation of the injections pregnancy was possible and corpora lutea were found in the ovaries. It was possible to impregnate hermaphrodites with a hypospadic and rudimentary penis and a vagina, and also hermaphodites without a vagina after laparotomy. R. J. O'C.

Urinary elimination of œstrogenic substances after injection of sex hormones. G. LAROCHE, H. SIMONNET, and E. BOMPARD (Compt. rend. Soc. Biol., 1939, **130**, 521—522).—No difference was observed in the urinary elimination of œstrogenic substances in ovariectomised women after treatment with progesterone or testosterone. H. G. R.

Disturbances of the post-partum period. W. BENTHIN (Med. Welt, 1939, **13**, 629—630).—A review. A. S.

Function of the liver in normal pregnancy and hyperemesis gravidarum. L. HEROLD (Arch. Gynäk., 1939, **168**, 509—524).—Urinary galactose excretion after ingestion of 40 g. of galactose is increased in hyperemesis gravidarum. Serum-urea was increased in 14 out of 25 cases; the xanthoprotein reaction was positive in 17 cases; free and bound amino-N in serum is increased; the increase in free amino-N following intravenous injection of glycine lasts for more than 1 hr.; serum-bilirubin is increased; the direct van den Bergh reaction was positive in 19 cases. Urine-bilirubin was increased when the serum-bilirubin was more than 1·5 mg.-%. Urinary porphyrin was increased in 18 cases. Blood counts, hæmoglobin concn., and fragility were normal. S. SCH.

Urinary porphyrin excretion in hyperemesis gravidarum and eclampsia. H. MITTELSTRASS (Arch. Gynäk., 1939, **168**, 351—358).—Urinary porphyrin excretion was increased in 35 cases of hyperemesis gravidarum. Urobilinogen and porphyrin excretion run parallel. Normal and excessive concns. of porphyrin in urine were found in severe cases of eclampsia. S. SCH.

Extraction of human placenta. E. LLOYD (Pharm. J., 1939, **142**, 565).—Placental tissue is extracted with an alcohol–$CHCl_3$ mixture; fat is removed with $CHCl_3$ and the aq. layer conc. in vac. Material pptd. from alcohol with ether is dissolved in 50% alcohol, evaporated to dryness, and is used for cancer therapy. E. B.

Assay of gonadotropic extracts in the post-partum rabbit. M. H. FRIEDMAN (Endrocrinol., 1939, **24**, 617—625).—Rabbits at 2—25 days post-partum give a more regular and sensitive response to gonadotropic extracts than at other stages of the reproductive cycle. V. J. W.

Gonadotropic hormone of pregnancy urine. I. Simple method of extraction and purification. S. GURIN, C. BACHMAN, and D. W. WILSON (J. Biol. Chem., 1939, **128**, 525—536).—Preliminary absorption of urine, collected between the 60th and 80th day of pregnancy, on benzoic acid is followed by (*a*) extraction with 30% aq. acetone or (*b*) extraction with 50% ethyl alcohol at p_H 6, evaporation, and extraction of the residue with 50% alcohol at p_H 4·8. Preps. assaying at min. doses on the postparturient rabbit at 500—2000 units per mg. and 1000—3000 units per mg. respectively are thus obtained. A small amount of further purification is obtained by treatment with tannic acid, I in KI, or by dialysis. The preps. contain a carbohydrate–polypeptide complex and although unstable in aq. solution can be heated to 100° in glycerol without loss. T. F. D.

Pregnancy reaction in case of hæmatomole. K. EHRHARDT (Dtsch. med. Wschr., 1939, **65**, 800—801).—The prolan pregnancy reaction was positive 5 months after the intrauterine death of the fœtus in a case of hæmatomole. A. S.

Substances in pregnancy urine stimulating vaginal contraction. K. SIEVERS, R. NEUMAYER, and R. DEPPER (Arch. Gynäk., 1939, **168**, 459—467).—Pregnancy urine contains a substance which, on intravenous injection into rabbits, produces contraction of the vagina. The substance was found up to 8 days post-partum. S. SCH.

Pseudo-pregnancy and Aschheim-Zondek reaction. H. LIMBURG (Arch. Gynäk., 1939, **168**, 368—379).—Six cases of positive Aschheim-Zondek reaction without pregnancy are reported. The women suffered from persistent corpus luteum and various types of ovarian tumours. S. SCH.

Nature of the carbohydrate in the gonadotropic substance of pregnancy urine. S. GURIN, C. BACHMAN, and D. W. WILSON (Science, 1939, **89**, 62—63).—The nonhexosamine sugar of the gonadotropic hormone consists of galactose units. W. F. F.

Effect of testosterone propionate on urinary excretion of androgens and œstrogens in eunuchoidism. W. H. HOSKINS, J. R. COFFMAN, F. C. KOCH, and A. T. KENYON (Endocrinol., 1939, **24**, 702—710).—25 mg. daily of testosterone propionate raised the excretion of both androgenic and œstrogenic hormones to normal vals. in 4 patients. V. J. W.

Influence of vehicle on length and strength of action of testosterone propionate. J. B. HAMILTON and R. I. DORFMAN (Endocrinol., 1939, **24**, 711—719).—Action on comb-growth of the day-old chick was maintained by implanted crystals for 71 days, by solution in beef fat for 44 days, and in peanut oil for 17 days. Wax and mineral oil were still less lasting. V. J. W.

Effect of temperature on reponse of bantam capons to androsterone. A. M. HAIN (Quart. J. Exp. Physiol., 1938, **28**, 353—355).—The effect of variations in temp. on the response of the bantam capon comb to androsterone is equal to that of variations in length of daylight. T. S. G. J.

Changes in testis and prostate after administration of testicular preparations. R. RÖSSLE and H. ZAHLER (Virchow's Archiv, 1938, **302**, 251—

300).—Dogs were given orally or subcutaneously aq. or lipoid extracts of testes, androsterone, or testosterone, and the testes and prostate examined histologically. Although the aq. extracts contained no sex hormone and the lipoid extracts only little, the same effects on the testes were observed as after administration of testosterone, viz., changes ranging from stimulation of the spermatogenic epithelium to a complete cessation of spermatogenesis. These effects were seen in normal dogs and particularly in animals in which one testis had been removed prior to administration of the above preps. Clinically, increase in vitality and improvement of the fur were observed, especially in senile dogs. The improvement in the general condition was also found in dogs with severe changes in the testes. The prostate became hyperplastic after administration of any of the preps. In castrated dogs, however, the aq. and lipoid extracts were without effect on prostrate and general condition, while testosterone was effective. H. W. K.

Effect of iodine on interstitial cells of the testis. C. W. Hooker and G. C. Newman (Endocrinol., 1939, **24** 720—722).—Subcutaneous administration of NaI caused no loss of wt. or testicular damage in rats or mice. V. J. W.

Comb atrophy after adult castration (bantam cocks). A. M. Hain (Quart. J. Exp. Physiol., 1938, **28**, 349—352).—The combs of bantams after adult castration regress more in height than in length. The % regression in height varies with the initial size but in length is almost const. at 40%. The levels to which the comb regresses after adult castration are much higher than those of birds castrated when immature, probably owing to the existence in the adult of a large proportion of fibrous tissue unaffected by endrocrine stimuli. T. S. G. J.

Nerve supply of the testis. D. Wein (Z. Zellforsch., 1939, **29**, 226—233).—The testes of the human fœtus and young cat were investigated by Bielschowsky-Gross technique. The fine nerve fibres of the interstitial tissues form a thick intraplasmatic plexus with occasional Schwann's nuclei. This plexus corresponds with Boeke's ground plexus or the rougher part of Stöhr's terminal reticulum. Morphological investigations showed that, in the cat, the interstitial tissue and the testicular tubules were supplied only by autonomic fibres. R. J. O'C.

Treatment of cryptorchidism with gonadotropic substance. C. Zelson (J. Pediat, 1939, **14**, 452—461).—26 strictly selected cases of cryptorchidism were treated with gonadotropic hormone, with complete descent in 8 (5 unilateral and 3 bilateral). All patients showed some genital enlargement. In the unsuccessfully treated patients, the testicles and scrotum returned to their original pretreatment size within 3—6 months after cessation of treatment. Treatment can be expected to be successful within 3 months and generally before 10,000 units of hormone have been injected; 3 injections a week are sufficient. 6 of the successful cases were under 10 years of age. C. J. C. B.

Influence of the water-soluble gonadotropic factor of pregnancy urine on the testes of the normal immature and mature rat. H. S. Rubinstein and A. Abarbanel (J. Lab. clin. Med., 1939, **24**, 799—803).—The water-sol. gonadotropic factor of pregnancy urine injected into normal mature or immature rats leads to precocious testicular descent, significantly enlarged testes (by wt.), and increased interstitial tissue. This hormone stimulates germinal cell proliferation, but it does not hasten maturation. (6 photomicrographs.) C. J. C. B.

Treatment of the undescended testis with hormones. C. E. Rea (Surgery, 1938, **4**, 552—561).—Endocrine imbalance alone does not fully explain the cause or give a rational basis for treatment in all cases of true testicular maldescent. In 36 patients with undescended testes treated by gonadotropic substances at the University of Minnesota Hospital degrees of descent were noted in 6. G. K. H.

Life expectation of human spermatozoa. B. Belonoschkin (Münch. med. Wschr., 1939, **86**, 847—850).—The life expectation of human spermatozoa suspended in 0·9% NaCl solution at 37° is 12 hr.; it is 2½ hr., after artificial insemination, in the vagina. Spermatozoa placed in the cervix are mobile up to 48 hr., in the uterus up to 24 hr. Spermatozoa were found in the uterus 3 min. after coitus. Spermatozoa take 1 hr. in the absence of orgasm to reach the uterine cavity. No spermatozoa were found in the Fallopian tubes 2½ days after coitus. A. S.

(xiii) DIGESTIVE SYSTEM.

p_H of human parotid saliva. V. Zagami and G. Di Stefano (R. C. Atti Accad. Lincei, 1939, [vi], **29**, 211—215).—The p_H is 5·37—7·72 (electrometric) at 18°; it is independent of the quality of the gustatory stimulus but increases as its intensity increases. For a stimulus of const. intensity the p_H is the higher the longer is its duration. S. O.

Sensations of hunger and satiety. F. Monauni (Wien. Arch. inn. Med., 1938, **32**, 159—188, 215—240).—During hunger, similar findings were obtained as after an insulin injection, *i.e.*, a tonically contracted stomach, hypoglycæmia, and gastric hypersecretion. After a meal, the symptoms resemble those following an injection of adrenaline, *i.e.*, decreased secretion and hyperglycæmia. A. S.

Effect of benzedrine sulphate on stomach and intestine. K. H. Beyer and W. J. Meek (Arch. intern. Med., 1939, **63**, 752—759).—In man benzedrine sulphate decreases the initial emptying time of the stomach but prolongs the final emptying time. The former is probably due to increased gastric tone, the latter to inhibition, as shown by experiments on the dog's stomach. There was no evidence of inhibition of pyloric tonus. C. A. K.

Epithelial functional rejuvenation in mucous cells of gastro-intestinal tract and parietal cells of stomach. N. W. Popoff (Arch. Path., 1939, **27**, 841—887).—In rabbits (using special staining methods) it is shown that normally the mucous cell of the intestine repeatedly passes through successive phases of secretory activity; when the cell is finally

exhausted it does not perish, but loses its response to normal or artificial secretory stimuli and undergoes a rearrangement manifested by the appearance, accumulation, and gradual disappearance of substances which can reduce metallic salts. The cell also changes its position, dedifferentiates, and eventually returns to the state of a normal secreting cell. Whenever mucous cells capable of function and rejuvenation are found in tumours argentaffin cells are also found which have this rejuvenating function and are not exocrine, endocrine, or neurocrine. It is the ability of the cells to function and to rejuvenate that makes tumour growth orderly and slow. If the cells fail to rejuvenate, but begin to regenerate, they may become malignant. Under unfavourable conditions such as advanced age, stasis, or continued irritation, the cycle of rejuvenation may be interfered with, and the products of their disintegration taken up by macrophages to lead to patchy melanosis of the bowel. Paneth cells have been shown to reduce metallic salts at some stage, but have nothing in common with mucous or argentaffin cells. Both pyloric and cardiac mucus secreting cells show argentaffin cells of rejuvenation type. (24 photomicrographs.) C. J. C. B.

Effect of constant gastric suction on acid–base equilibrium of the body. J. M. Sullivan (Ann. Surg., 1939, **109**, 309—316).—The production of alkalosis and death by const. gastric suction is almost impossible under ordinary circumstances. If there is complete obstruction at the pylorus or operative stoma, alkalosis develops in 5—8 days unless saline solution is administered. G. K. H.

Action of carbon dioxide baths on gastric secretion. H. Nicol (Med. Welt, 1939, **13**, 603—605).—Patients with marked dermographic reactions showed an increase in gastric secretion when the skin was strongly stroked at the end of an alcohol test meal. Similar results were obtained with baths containing a high concn. of CO_2. A. S.

Effect of partial gastrectomy on acidity and peptic activity of gastric juice. F. B. St. John, C. A. Flood, and J. A. Gius (Surgery, 1939, **5**, 179—185).—26 patients were studied following partial gastrectomy; 22 had achlorhydria after a test meal. Gastric pepsin was markedly diminished in 21 of 24 cases. Three patients with anacidity had recurrent symptoms of ulcer. G. K. H.

Changes in acidity of gastric juice and in mucosa after various gastric operations. H. Kato (Arch. klin. Chir., 1939, **195**, 193—201).—Changes in acidity, gastric mucosa, pyloric stump, and upper part of the duodenum were investigated in healthy dogs (10—20 kg.) after various gastric operations for ventricular and duodenal ulcers. Gastro-enterostomy produced a slight fall in acidity with speedy return to normal. After Finsterer's resection, acidity fell markedly, especially if the pylorus was also removed; the remaining pyloric mucosa, duodenal stump, and peripheral mucosa showed striking atrophy. Longitudinal resection of the greater and lesser curvatures and V-shaped resection of the fundus always caused a fall in acidity with gradual return to normal after some months; ulcers were observed in 3 cases. No importance is attributed to the pylorus and the pyloric mucosa as regards acidity of the gastric juice. Resection of more than $\frac{2}{3}$ of the fundus caused a marked fall in acidity. This operation is regarded as valuable in the surgical treatment of ulcers as it eliminates the stomach wall and thus the chronic gastritis which leads to ulcer formation. Of 33 resection cases 7 subsequently developed ulcers in spite of a fall in post-operative acidity. It is concluded that these ulcers are due to nutritive disturbances of the mucosa caused by local vascular and nervous damage, and not to acidity of the gastric juice. B. W.

Gastric secretion after typhoid fever. M. Dobreff and I. Kaltscheff (Gastroenterologia, 1939, **64**, 44—51).—Fractional caffeine test meals were performed in 11 patients convalescent from typhoid fever who had previously been on a purely milk diet but were again receiving a normal diet. 13 showed hyperacidity, 9 normal acidity, and 1 hypoacidity. E. M. J.

Gastric secretion and basal metabolic rate (B.M.R.) in chronic rheumatoid arthritis. G. Edström (Acta med. scand., 1939, **99**, 228—256).—30% of 432 cases of chronic rheumatoid infective (atrophic) arthritis showed achylia or diminished response to histamine; 24% showed a subnormal B.M.R., the incidence being higher amongst the achylic group. During clinical improvement, the subacidity and lowered B.M.R. disappeared in most cases. In 148 cases of rheumatic polyarthritis no significant changes in gastric secretion and B.M.R. were observed. C. A. A.

Gastric anacidity in diabetics. E. Fenz (Wien. Arch. inn. Med., 1939, **32**, 283—294).—65 out of 116 cases of diabetes showed anacid, 20 hypacid, gastric secretion (caffeine test). Insulin increased the secretion of acid in patients with normal and hypacid gastric secretion. Acid secretion was not provoked by insulin in cases of achylia. There was no relationship between gastric secretion and severity of the diabetes. 44 patients suffered from diarrhœa; 78% of these patients had achylia. A. S.

Pseudo-achylia. W. Kerppola (Acta med. scand., 1939, **99**, 45—52).—In a group of cases which showed achylia following the Boas meal, free acid was secreted after a normal mixed meal. C. A. A.

Hormones of stomach and intestine. S. Ochi (Coll. Papers to Prof. Isikawa, Kyoto, 1938, 37—43).—A review of 27 earlier papers (Mitt. Med. Akad. Kyoto, Vols. 1—21). W. Bu.

Kallikrein in [saliva and] gastric juice. A. Korányi and T. Szenies (Klin. Woch., 1939, **18**, 544—546).—Human saliva contains a blood-pressure-lowering substance which seems identical with kallikrein or padutin. It is destroyed by the gastric HCl when given by mouth but is present in achlorhydric stomachs. E. M. J.

Mechanism of peptic ulceration. F. C. Mann (Brit. Med. J., 1939, I, 707—710).—A review. C. A. K.

Bile salts in treatment of peptic ulcer. G. S. Bergh (Surgery, 1938, **4**, 84—94).—In an uncontrolled group of 32 patients with gastric or duodenal ulcer, improvement occurred in 26 cases following the oral administration of bile salts. G. K. H.

Relation between stomach and kidneys. C. Dienst (Klin. Woch., 1939, **18**, 541—544).—9 cases of renal disease showed high gastric acidity and normal non-protein-N in blood; 11 other cases had low vals. for gastric HCl, and 7 of these showed raised non-protein-N vals. E. M. J.

Physico-chemistry of alimentary mucins. I. Isoelectric point. G. Domini (Boll. Soc. ital. Biol. sperim., 1939, **14**, 138—139).—Solubility data indicate an isoelectric point of p_H 3·94 for mucins from the œsophagus and large and small intestine and p_H 3·69 for gastric mucin. F. O. H.

Eumydrine in pyloric stenosis. H. St. H. Vertue (Arch. Dis. Childh., 1939, **14**, 173—179).—Eumydrine causes relaxation of the gastric musculature with a pronounced local and an insignificant general effect. It is a safe, rapid, and effective remedy in relaxing the pylorus in pyloric stenosis of infants. C. J. C. B.

Gastro-duodenal reflex. Kémal-Djénab (J. Physiol. Path. gén., 1939, **37**, 83—85).—Movements occurred in a pouch of the duodenum, isolated from gastric connexion, when the stomach was distended. This occurred after section of the connexions with the central nervous system and depends on the local nerve plexuses. Inhibition occurred first, followed by hyperactivity. It was not due to humoral influences as it was not obtained in cross-circulation experiments. C. A. A.

[Kynurenin in] intestinal obstruction and auto-intoxication. K. Mitsuba, S. Suehiro, and C. Itagaki (Klin. Woch., 1939, **18**, 284—287).—Intestinal obstruction with auto-intoxication is accompanied clinically as well as in rabbits and dogs by a rising content of serum and urine in kynurenin, a product of the decomp. of tryptophan (cf. Kotake, A., 1931, 514). Dog experiments show that a duodenum closed at both ends even with a gastrojejunostomy is the most potent producer of auto-intoxication. Animals with closed and isolated loops below the duodenal papilla die of perforation of the affected loop, the kynurenin vals. remaining low in serum and urine. E. M. J.

Distension factor in simple intestinal obstruction. O. H. Wangensteen and C. E. Rea (Surgery, 1939, **5**, 327—339).—By previous cervical œsophagostomy ileal obstruction may be studied in dogs with exclusion of swallowed air. The survival period of such dogs is prolonged. The digestive juices may be all absorbed if swallowed air is excluded. These experiments indicate that the mechanical factor of distension and not a "toxic factor" accounts for the lethal issue in ileal obstruction. G. K. H.

Effect of breathing 95% oxygen on intraluminal pressure occasioned by gaseous distension of obstructed small intestine. L. Rosenfeld and J. Fine (Ann. Surg., 1938, **108**, 1012—1021).—In cats when the obstructed small intestine was distended with air or N_2 death occurred less rapidly if O_2 rather than air was breathed. The intraluminal pressure of the intestine was reduced when O_2 was breathed. This type and degree of distension result in an increased amount of peritoneal fluid but no change in the wt. of the bowel wall. When the entire small intestine of the starved cat is converted into a closed loop and distended to a pressure of 800 mm. H_2O there is no increase in the fluid content of the intestine. G. K. H.

Structure and absorbent power of the terminal pancreatic duct. G. Pallot (Compt. rend. Soc. Biol., 1939, **130**, 669—671).—The histological structure and mineral content of the large terminal pancreatic duct in Teleosteans suggest that it has some absorbent function, perhaps serving to keep the mineral content of the secretion const. P. C. W.

Effect of ephedrine on pancreatic secretion. C. B. Craft (Surgery, 1938, **4**, 64—73).—In dogs, ephedrine decreases the output of pancreatic juice, and is more convenient to use than adrenaline. SiO_2 gel prevents skin erosion due to activated pancreatic juice. These facts may have clinical significance. G. K. H.

Results of exclusion of pancreatic secretion from intestinal tract, with special reference to effects on digestion and liver cell metabolism. F. F. Boyce and E. M. McFetridge (Surgery, 1938, **4**, 51—63).—In dogs in which the external pancreatic secretion was excluded from the intestinal tract, (*a*) the digestion of fat and protein was approx. normal, (*b*) fatty changes developed in the liver following partial or complete pancreatectomy, (*c*) such changes did not develop in the liver when lecithin was added to the diet nor when the pancreatic ducts were ligated and divided but the pancreas left *in situ*. G. K. H.

Operation for production of a permanent closeable pancreatic fistula. B. N. Boldyreff and W. F. Martin (Tohoku J. exp. Med., 1939, **35**, 144—154).—The technique of preparing a pancreatic fistula in the dog is described, by which the pancreatic juice flows into the duodenum when not collected through the fistula. This method avoids illness of the dogs through loss of pancreatic juice and degeneration of the pancreas through occlusion of the duct. Operated dogs have lived for over 3 years. E. R.

Changes in intramural nerve plexus of large intestine in colitis. S. Wail (Acta Med. U.R.S.S., 1938, **1**, 445—457).—In experimental colitis changes in the intramural ganglia were found in 25% of cases and in 50% when, in addition, there was injury to the cœliac ganglion. W. M. H.

Ætiology of ulcerative colitis. R. Lium and J. E. Porter (Amer. J. Path., 1939, **15**, 73—78).—In 6 cases of ulcerative colitis the severest lesions occur in the rectum and overlying the tenial bands, suggesting that hypermotility and spasm of these strong muscles cause the disease. (5 photomicrographs.) C. J. C. B.

Nitrogenous substances in muscle layer and mucous membranes of duodenum and large intestine [of dogs]. K. Ri (J. Biochem. Japan, 1939, **29**, 265—283).—Data for the contents of choline,

purine-N, and, after hydrolysis, various amino-acids are tabulated. F. O. H.

Congenital familial steatorrhœa with fibromatosis of the pancreas and bronchiolectasis. S. Rauch, A. M. Litvak, and M. Steiner (J. Pediat., 1939, **14**, 462—490).—2 cases (with 1 post-mortem) are described with a review of the literature. (4 photomicrographs.) C. J. C. B.

Absorption of phosphates from the intestine. V. N. Patwardhan and N. G. Nhavi (Biochem. J., 1939, **33**, 663—670).—The increase in the concn. of inorg. and acid-sol. P of the lymph which occurs when Na ortho- or glycero-phosphate is injected intraduodenally runs parallel with that in the arterial blood. Absorption of the former is rapid at p_H 9·4 and less at p_H 7·0 and 4·9, whilst absorption of the latter is equal to that of PO_4''' at p_H 7·0 and less at 4·9. Blood-Ca falls during absorption of Na glycerophosphate but rises if the Ca salt is used. P is absorbed by the capillaries as well as by the lacteals. Na phytate is not absorbed. P. G. M.

Enteral absorption of iron. W. Heubner (Z. physiol. Chem., 1939, **258**, III).—Polemical against Vosskühler (A., 1939, III, 409). W. McC.

Use of silk, catgut, and Noble plication with reference to abdominal adhesions. J. K. Donaldson and R. R. Cameron (Surgery, 1939, **5**, 511—521).—The effect of the above sutures in the peritoneal cavities of dogs was studied. Soft pliable untreated black silk had little tendency to cause adhesions. G. K. H.

Reflex influence of rectum on tonus and movements of stomach. E. R. Loew and T. L. Patterson (Quart. J. Exp. Physiol., 1938, **28**, 305—314).—Pressure in the rectum of the dog slightly distended by an intrarectal balloon produces no effect on tonus or motility of the fasting stomach. Greater pressure (20—48 mm. Hg) produces an inhibition of the gastric motility and tonus of duration and degree dependent on the magnitude of the pressure. The stomach generally recovers from the inhibition even if the pressure is kept const. The pressure may decrease owing to rectal adaptation. The introduction of undiluted gall-bladder bile of the dog into the rectum also causes an inhibition of the motility but glucose and physiological saline have no such effect. T. S. G. J.

Utilisation of dogs in experimental proctology. L. H. Block (Surgery, 1939, **5**, 554—559).—The dog lends itself well to proctologic surgery and every type of operation may be performed. G. K. H.

(xiv) LIVER AND BILE.

Hippuric acid synthesis as test of liver function. G. A. Lindeboom (Acta med. scand., 1939, **99**, 147—161).—6 g. of Na benzoate were given orally and the excretion of hippuric acid in the urine during the next 4 hr. was determined by Quick's method. The mean normal val. as benzoic acid was 3·7 g. Lower vals. were obtained in most cases of liver cirrhosis and hepatitis and also in obstructive icterus, cardiac incompetence with enlarged liver, and in kidney diseases. The variations in the latter cases are not significant. The tests were combined with galactose-tolerance tests and the Takata reaction. C. A. A.

Rose-Bengal excretion and hippuric acid synthesis tests for liver function; a comparison. W. P. Stowe (J. Lab. clin. Med., 1939, **24**, 866—868).—The tests showed striking parallelism. Rose-Bengal tests are more rapid and are more useful in cases of impaired kidney function, while in severe jaundice the Quick hippuric acid test is preferred. C. J. C. B.

Liver dysfunction as a factor in renal lithiasis. W. J. Ezickson (J. Lab. clin. Med., 1939, **24**, 836—840).—Of 39 cases of lithiasis 94% showed vitamin-*A* deficiency, 50% showed some liver damage by the bromsulphalein test (non-fasting) and 90% when fasting. C. J. C. B.

Seasonal variations in the liver of *Bufo arenarum*. P. Mazzocco (Rev. Soc. argent. Biol., 1938, **14**, 123—144).—In (*a*) summer (Jan., Feb.) toads are very active and take abundant nourishment. In (*b*) autumn and winter (March to Aug.) activity and feeding are progressively reduced to the quiescence of hibernation. In (*c*) spring (Sept., Oct.), feeding is still reduced but there is intense sexual activity. In (*d*) Nov. and Dec., feeding and general activity increase to a high level. The characteristics of the liver during the 4 seasons are: (*a*) wt. high, water % low but total water high, org. matter % high, high protein, high total and % fatty acids, glycogen relatively low, high mineral content; (*b*) wt. at a high level, water % increases, total water does not vary, org. matter % decreases without variation in the total, const. high val. of protein, considerable decrease in fatty acids, glycogen at highest val., mineral content decreases slightly; (*c*) during the sexual crisis liver wt. and all its components decrease considerably in total and % val.; this is preceded in the male by an increase in fatty acids during August; in the female this increase is slight; (*d*) the wt. of the liver and all its org. components increase rapidly. The male has a relatively heavier liver, but the abs. liver wt. in the female is greater, because of the larger body-wt. Glycogen total and % val. are higher in the male; minerals are more abundant in the female liver. J. T. L.

Liver metabolism in constitutional diseases and those of the central nervous system. D. Jahn (Klin. Woch., 1939, **18**, 410—414).—A review of recent advances. E. M. J.

Influence of foodstuffs on susceptibility of liver to injury by chloroform. S. Goldschmidt, H. M. Vars, and I. S. Ravdin (J. clin. Invest., 1939, **18**, 277—289).—In rats, the incidence and the severity of damage to the hepatic cells, 24 hr. after 1 hr. of $CHCl_3$ anæsthesia, increase progressively with increase in concn. of liver-lipins, and are independent of liver-glycogen concn. at the beginning of anæsthesia. Protection against hepatic injury following a carbohydrate-rich diet is mainly due to the associated reduction in liver-lipin content. A high-protein diet previous to anæsthesia markedly reduces the incidence of hepatic cellular necrosis, even in livers with

a high lipin content. Rats starved for 24 hr. before anæsthesia had a greater incidence of hepatic damage than fed rats with the same degree of liver-lipin. C. J. C. B.

Liver necrosis following burns simulating lesions of yellow fever. T. H. Belt (J. Path. Bact., 1939, **48**, 493—498).—4 cases of extensive superficial burns in which death occurred within 4 days presented severe liver damage with mid-zonal necrosis, Councilman lesions, and intranuclear inclusion bodies. These findings were practically indistinguishable from those occurring in yellow fever. (6 photomicrographs.) C. J. C. B.

Value of Takata-Ara reaction in the diagnosis of hepatic diseases. T. Sparchez and E. Viciu (Gastroenterologia, 1939, **64**, 23—43).—The reaction was positive in 90% of 41 cases of cirrhosis of the liver; it indicated generally the severity of any disease affecting the liver but was occasionally positive in non-hepatic diseases. E. M. J.

Osteomalacia hepatica. E. Ask-Upmark (Acta med. scand., 1939, **99**, 204—227).—Evidence is reviewed that osteomalacia may result from liver damage, *e.g.*, cirrhosis, whereby storage of vitamin-*D* is impaired. The case of a 57-year old man is discussed. C. A. A.

Serological differentiation of obstructive from hepatogenous jaundice by flocculation of kephalin-cholesterol emulsions. F. M. Hanger (J. clin. Invest., 1939, **18**, 261—269).—Emulsions prepared from mixtures of sheep brain, kephalin, and cholesterol are not usually flocculated by normal human serum or by serum from patients with obstructive jaundice, but are by sera from cases of active liver disease. Certain patients with jaundice appearing immediately following salvarsan injections may, however, give a negative flocculation reaction and thus simulate obstructive jaundice. The test does not parallel hepatic function tests. Flocculation depends on the capacity of an altered globulin constituent of the serum to beome affixed to the colloidal elements of the emulsion. C. J. C. B.

Elimination of cholic acids in patients with liver disease. B. Josephson (J. clin. Invest., 1939, **18**, 343—350).—In jaundice the increase in cholic acid content of the blood after an injection of Na cholate is greater than in normals. It is not greater in liver diseases without jaundice. The subsequent decrease is delayed in acute hepatitis but not in jaundice due to obstruction of the bile ducts. A cholic acid elimination test keeps the differential diagnosis between the 2 types of jaundice. C. J. C. B.

Elimination of cholic acids in man. B. Josephson and H. Larsson (Acta med. scand., 1939, **99**, 140—146).—Na cholate injected intravenously into 6 subjects who had had a cholecystectomy a year previously disappeared within 30 min. from the blood and was quantitatively excreted into the bile. After 1 hr. most of the cholate could be recovered from the bile partly unconjugated. C. A. A.

Liver-lipins of dogs with ligature of the external pancreatic ducts. M. L. Montgomery, C. Entenman, and I. L. Chaikoff (J. Biol. Chem., 1939, **128**, 387—398).—The livers of dogs, with completely ligatured pancreatic ducts and fed on a diet devoid of pancreas, contain excess of fat after 12—24 weeks regardless of change in body-wt. This is prevented by the addition of raw pancreas to the diet. The mechanism of the action is discussed. E. M. W.

Anti-menorrhagic factor of mammalian liver-fat. H. O. Wiles and S. Maurer (Science, 1939, **89**, 293—294). W. F. F.

Distribution of lipase and arginase between the nuclei and protoplasm of the liver. M. Behrens (Z. physiol. Chem., 1939, **258**, 27—32; cf. A., 1938, III, 722).—The nuclei and protoplasm of the livers of fasting guinea-pigs and rabbits are separated by the author's method (dispersion in CCl_4 and benzene) and it is shown by the stalagmometric method (hydrolysis of tributyrin) that the lipase content of the nuclei is only 5% or less of that of the protoplasm. Possibly the nuclei, when quite free from protoplasm, contain no lipase. The arginase contents of the nuclei and protoplasm, determined by Edlbacher's urease method (A., 1925, i, 1505), are approx. equal. A distillation vessel for use in this method is described. The method of separation is applicable only when the liver-glycogen is low. W. McC.

Liver and biliary tract. C. H. Greene and R. Hotz (Arch. intern. Med., 1939, **63**, 778—808).—A review. C. A. K.

Emptying mechanism of the gall bladder. H. F. O. Haberland (Z. ges. exp. Med., 1939, **105**, 303—313).—The gall bladder is not emptied by active contractions of its muscular wall but by suction produced by duodenal peristalsis and the flow of bile in the common bile duct; in addition, respiratory fluctuations of intra-abdominal pressure are important. A. S.

Gall stones containing lithocholic acid from human beings. Cases observed and published in Sweden. C. T. Mörner (Z. physiol. Chem., 1939, **259**, 35).—A summary of 10 recorded cases in women, 8 being over 60. J. N. A.

Effect of experimental hyperthyroidism and hypothyroidism on concentration of cholesterol in hepatic bile. J. Johnson and C. Riegel (Surgery, 1939, **5**, 260—266).—Following the administration of thyroid extract to dogs the blood-cholesterol fell markedly but there was no effect on cholesterol concn. or total cholesterol output of the hepatic bile. Following total thyroidectomy in dogs there was no effect on cholesterol concn. or total cholesterol output of hepatic bile, although the blood-cholesterol rose markedly. G. K. H.

Bile of "akajei" fish (*Dasyatis akajei*) and the constitution of scymnol. H. Ashikari (J. Biochem. Japan, 1939, **29**, 319—324).—The bile contains small amounts of cholic acid whilst 700 c.c. yield 11 g. of scymnol (oxidation products of which indicate it to be 3 : 7 : 12-trihydroxy-24 : 25-epoxy-ψ-cholestan-27-ol). F. O. H.

[Composition of] fish bile. Occurrence of cholic acid and a bile acid, $C_{27(28)}H_{46(48)}O_6$, in

shark bile. K. Ohta (J. Biochem. Japan, 1939, **29**, 241—245).—The bile contained cholesterol, α-scymnol, m.p. 193°, cholic acid, and the above *acid*, m.p. 252—255°, $[\alpha]_D^{23}$ −30·58° in alcohol (*methyl* ester, m.p. 94—96°), oxidised to a *keto-acid*, m.p. 175°. F. O. H.

(xv) KIDNEY AND URINE.

Renal threshold for glucose. H. M. Thomas and H. Southworth (Ann. int. Med., 1939, **12**, 1560—1575).—A case of renal glycosuria had a renal threshold below 56 mg.-% of blood-glucose. C. A. K.

Pathogenesis of renal glycosuria. G. Monasterio (Klin. Woch., 1939, **18**, 538—541).—Unilateral sympathetic denervation of the kidney did not influence a case of renal glycosuria. Biopsy at the same time showed that the convoluted tubules were dilated and their epithelium flattened. E. M. J.

Sodium ferrocyanide excretion in the estimation of renal function. M. Plotz, M. Rothenberger, E. Ferguson, and V. Ginsberg (J. Lab. clin. Med., 1939, **24**, 844—847).—The $Na_3Fe(CN)_6$ test was performed 251 times on 145 patients. It was more sensitive in detecting early renal damage in cases of hypertension than the phenolsulphonephthalein or the urea-clearance test, but was not so reliable in revealing normal renal function in the normal controls, or renal impairment in renal disease. Reactions occurred in 9·6% of cases. C. J. C. B.

Action of potassium salts on isolated kidney of dog. R. M. Isenberger and M. W. Tyler (J. Pharm. Exp. Ther., 1939, **65**, 461—474).—The isolated kidney was perfused by means of the heart–lung prep. K salts increased the urine flow, and the concn. and output of K, Cl′, Na, and urea. E. M. S.

Sodium and chlorine retention without renal disease. E. N. Allott (Lancet, 1939, **236**, 1035—1037).—5 cases of Na and Cl retention in the blood are described, other electrolytes being excreted normally. Autopsy showed no signs of renal damage. The condition is attributed to excessive tubular reabsorption of Na and Cl. C. A. K.

Respiratory quotient of kidney extracts. H. Kalckar (Enzymologia, 1939, **6**, 143; cf. A., 1939, III, 424).—The O_2 consumption of extracts of renal cortex (rabbit) is very high and remains const. during the first 30 min.; the rate is not affected by dyes. Oxidative decarboxylation occurs in the extracts since their R.Q. is approx. 0·9. W. McC.

Renal changes following renal vein thrombosis. E. Behr (Arch. int. Méd. exp., 1938, **13**, 273—334).—Out of 4600 autopsies there were 37 cases of renal vein thrombosis. Only 7 had abnormal kidneys; in 6 of these there was evidence that the thrombosis developed rapidly. In all but 1 of the cases with normal kidneys the evidence pointed to a slow development. The abnormality consisted of hæmorrhagic infarction, red or white necrosis. Thrombosis was produced in rabbits by ligature of the renal vein or by application of $FeCl_3$. The latter procedure produced a slow thrombosis which rarely affected the kidney. Following the ligature the kidney swelled and many hæmorrhagic infarcts developed; this stage was succeeded by a spreading necrosis. The red colour of the tissue gradually disappeared with a concurrent hæmoglobinuria. The lysis of the erythrocytes was due to a hæmolysin that could be demonstrated in the affected though not in a normal kidney. There was then a slow reduction in the kidney size and failure of function with the final production of a small sclerotic kidney with anuria. P. C. W.

Experimental glomerulonephritis. H. Moers (Dtsch. Arch. klin. Med., 1939, **183**, 475—500).—Blood-free sterile saline extracts of rabbit kidneys were repeatedly injected into the peritoneum of ducks; the duck's serum was then intravenously injected into rabbits in doses up to 10 c.c. on 2 successive days. The rabbits developed typical glomerulonephritis (hypertension, increase in non-protein-N, hæmaturia, albuminuria). The severity of the disease depended on the amount of serum given. Some rabbits died of uræmia. A. S.

Blood flow through the kidney in experimental glomerulonephritis. H. Sarre (Dtsch. Arch. klin. Med., 1939, **183**, 515—551).—The blood flow through the kidney of rabbits, suffering from experimental glomerulonephritis produced by Masugi's method (intravenous injection of serum of ducks sensitised by kidney extracts), was measured with the stromuhr and found normal. Diseased kidneys react in the same way to adrenaline and to denervation as normals. Intravenous injection of Indian ink produces an accumulation of the dye in the glomeruli; the blood flow through the kidney is impaired only in the late stages of the Masugi nephritis. Denervation of the kidney does not modify the occurrence or course of the glomerulonephritis. The nephritic kidney does not react with constriction of the glomerular capillaries to mechanical stimulation of the kidney surface. A. S.

Genesis of hyperlipinæmia in tubular nephritis. S. Katsura, Z. Yosizumi, K. Nanba, and R. Kobayasi (Tohoku J. exp. Med., 1938, **34**, 345—356).—In healthy rabbits and in rabbits poisoned by U nitrate the lipin fractions of the blood were determined on a diet rich or poor in fat. The increased plasmalipin in the poisoned rabbits (with tubular nephritis) is connected with the fat content of the food, the lipins being retained in the blood for a longer period owing to the damaged kidney tubules. In treating cases of tubular nephritis consideration must be given to the amount of fat in the diet. F. Ja.

Complementary activity of serum in nephritis. C. E. Kellett and J. G. Thomson (J. Path. Bact., 1939, **48**, 519—531).—The complementary activity of the serum for sensitised sheep cells was estimated in 38 cases of nephritis. In every case of acute glomerulonephritis examined within 4 weeks of the onset, complementary activity was much lower than normal. Such decrease may be of practical diagnostic val. C. J. C. B.

Nephrosis due to carbon tetrachloride. H. Smetana (Arch. intern. Med., 1939, **63**, 760).—3 cases of CCl_4 poisoning with signs of nephrosis are reported. Glomerular damage with hypertension and N retention also occurred. C. A. K.

Nephrosis from obstruction of the inferior vena cava. H. A. Derow, M. J. Schlesinger, and H. A. Savitz (Arch. intern. Med., 1939, **63**, 626—647).—A case of chronic progressive occlusion of the inferior vena cava and renal veins showed the nephrotic syndrome. Autopsy revealed only slight cloudy swelling of the kidney tubules, œdema of the interstitial tissue, and no abnormality of the glomeruli. C. A. K.

Treatment of lipoid nephrosis. R. H. Major (Ann. int. Med., 1939, **12**, 1555—1559).—Antuitrin "G," choline, and adrenal cortex hormone had no effect on lipoid nephrosis. The best therapeutic results followed a high-carbohydrate diet + blood transfusions and diuretics. C. A. K.

Effect of diet on pathological changes in rats with nephrotoxic nephritis. J. E. Smadel and L. E. Farr (Amer. J. Path., 1939, **15**, 199—216).—In rats (Wheelan strain) the chronic nephritis which follows the administration of anti-kidney serum is markedly influenced by isocaloric diets containing different proportions of protein and carbohydrate. A low-protein–high-carbohydrate diet induced remission and a high-protein–low-carbohydrate diet caused renal failure. (13 photomicrographs.) C. J. C. B.

Pathogenesis of uræmia. K. Voit (Med. Klin., 1939, **35**, 565—567).—A review. A. S.

Permeability of the bladder of the frog to eosin. R. Latarjet, A. Jullien, and A. Popier (J. Physiol. Path. gén., 1939, **37**, 86—100).—The amount of eosin passing through the bladder wall (Δq) can be expressed as $\Delta q = k(c_1 - c_2)$. The const. k (permeability through diffusion) is about 1×10^{-5} at 15° and $1{\cdot}70 \times 10^{-5}$ at 30°. At 0° diffusion practically ceases. C. A. A.

Time factors in water drinking in dogs. R. T. Bellows (Amer. J. Physiol., 1939, **125**, 87—97).—Dogs with œsophageal fistulæ were allowed to drink at regular intervals during water privation. The quantities of water so sham-drunk were proportional to the water deficit. Observations were made on sham drinking after a quantity of water equal to the deficit had been given by fistula. Passage of an excessive amount of water through the mouth and pharynx gives immediate but temporary satisfaction. Entrance of water to the amount of the deficit into the alimentary tract below the pharynx inhibits the repetitive act of drinking to the actual amount of the deficit; the subpharyngeal factor also confers permanent satisfaction of thirst after a delay of 10—20 min. Sham-drinking began at once after intravenous injection of NaCl, reaching a max. in 10 min. preceding max. diuresis; pitressin before NaCl injection inhibited sham drinking for 10—20 min. After urea, sham-drinking began after a delay of 10—15 min. M. W. G.

Variations of the molecular concentration of the urine of fresh-water stenohaline teleosts as a function of the salinity of the surrounding medium. G. Martret (Compt. rend., 1939, **208**, 837—839).—F.p. determinations on the urine of carp acclimatised to water of increasing salinity show that for dil. solutions (Δ below −0·15°) the concn. of the urine is independent of the external concn.; with solutions of Δ −0·15° to −0·90° the concn. of the urine is about 5% below that of the outside fluid; when Δ is −0·90° to −1·04° the concn. of the urine does not increase in proportion to that of the bath and death occurs when $\Delta = -1{\cdot}04°$. Within the range $\Delta = -0{\cdot}50°$ and −0·90° the mol. concns. of the blood and urine are closely parallel. They diverge both below and above these limits. For solutions with Δ more than −0·70° the blood and outside fluid are isotonic. J. L. D.

Surface tension and absorption spectrum of female urine over menstrual cycle. W. T. Earlam and R. A. Morton (J. Physiol., 1939, **95**, 404—409).—Male urines exhibit uniformly higher vals. for the surface tension (γ) than female urines, indicating a greater tendency to contamination of the latter after leaving the bladder. The decrease in γ is especially marked during menstruation, but the capillary-active product is best studied as a constituent of vaginal washings. J. A. C.

Surface tension of urine and serum in surgical kidney diseases. H. Matuda (Tohoku J. exp. Med., 1938, **33**, 292—303).—In 147 cases, especially tuberculosis, the surface tension of both was lowered compared with normal persons. F. Ja.

Excretion of calcium and magnesium in urine. L. Lundgren (Skand. Arch. Physiol., 1939, **82**, 29—38).—The urinary Ca excretion of a healthy subject was not reduced by addition of Mg salts to the diet, as was previously reported in rats. A. S.

Relationship between urinary sodium and water excretion. U. Schaare (Z. ges. exp. Med., 1939, **105**, 314—321).—Urinary Na, NaCl, and water were determined in various pathological conditions. A. S.

Occurrence of histamine in normal urine. D. Ackermann and H. G. Fuchs (Z. physiol. Chem., 1939, **259**, 32—34).—Normal urine (10 l.) was treated with 4 kg. of Lloyd's reagent, and the histamine eluted from the ppt. with $Ba(OH)_2$ and purified by pptn. as the phosphotungstate. A biological test using guinea-pig intestine showed the presence of 0·117 mg. of histamine. A further 1000 l. of urine after treatment with conc. aq. NH_3 saturated with $Zn(OH)_2$, removal of Zn and NH_3, and pptn. as phosphotungstate gave a solution which contained 0·658 mg. of histamine. J. N. A.

Excretion of uropterin by man in health and disease. W. Koschara and A. Hrubesch (Z. physiol. Chem., 1939, **258**, 39—46; cf. A., 1938, II, 66).—The uropterin of acidified urine is conc. by adsorption on fuller's earth and is determined in aq. Na_2CO_3 by measuring the intensity of fluorescence with a step photometer. The amount of uropterin excreted daily in the urine of healthy persons is approx. 1 mg. but is sometimes (*e.g.*, after unaccustomed strenuous exercise) 50% higher. The normal val. is independent of age (4—60 years), sex, season, and ingestion of uropterin, which is, accordingly, of endogenic origin. The val. is increased in pernicious and severe secondary anæmia, panmyelophthisis, lymphatic leukæmia, lymphogranuloma, and in-

fectious diseases such as scarlet fever and pneumonia. Uropterin does not increase the respiration of the erythrocytes, red bone-marrow, spleen, liver, or kidney of rabbits. At a concn. of $1 : 10^5$ it inhibits fermentation by yeast. The erythrocyte content of rat's blood is not increased by uropterin (cf. Tschesche and Wolf, A., 1937, III, 370). W. McC.

Recording of urine flow. F. R. Winton (J. Physiol., 1939, **95**, 60—61P). J. A. C.

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

Chemical procedures used in clinical diagnosis. M. Bodansky (Amer. J. clin. Path., 1939, 9, 257—268).—A crit. review. C. J. C. B.

Clinical sense and clinical science. J. A. Ryle (Lancet, 1939, **236**, 1083—1087).—A lecture. C. A. K.

Statistics of some biochemical variables on healthy men in the age range of 20 to 45 years. E. M. Jellinek and J. M. Looney (J. Biol. Chem., 1939, **128**, 621—630).—Statistical data for the constituents of urine and blood of healthy men are tabulated and discussed. A. L.

Allometric growth of the forelimb in cattle. G. Pontecorvo (J. Agric. Sci., 1939, **29**, 111—114).—The increase in length of the forelimb in Chianina cattle shows a simple negative allometry relative to the increase in trunk length from birth to 3 years. The relation between height at withers and length of trunk is expressed as $y = bx^{\alpha}$. For 5 breeds of cows the growth const. (α) varied within fairly narrow limits but b differed widely. The change from fœtal positive to post-natal negative allometric growth does not occur at or before birth. A. G. P.

Action of tonsils on growth of axolotl and fish. I. S. Pohl (Z. ges. exp. Med., 1939, **105**, 330—336).—Young *Xiphophorus helleri*, *Girardinus guppii*, and axolotls were fed over many weeks with dried pig's tonsils. Growth was considerably increased. Dried ox spleen had no effect. *X*-Irradiated tonsils were less effective than non-irradiated. A. S.

Growth of the large-mouth black bass, *Huro salmoides*, in Lake Naivasha, Kenya. D. H. Thompson (Nature, 1939, **143**, 561—562).—Growth curves (length, age) are compared for *H. salmoides* from Lake Naivasha, the Winsconsin Lakes, and Horseshoe Lake, Illinois. Marked differences are noted. W. F. F.

Body temperature of reptiles in natural surroundings. A. Sergeev (Compt. rend. Acad. Sci. U.R.S.S., 1939, **22**, 49—52).—Full numerical details are recorded. W. F. F.

Duration of life without food in *Drosophila pseudo-obscura*. O. Lilleland (Biol. Bull. Wood's Hole, 1938, **74**, 314—318).—Two races, *A* and *B*, were compared. In both, low temp., high humidity, and low population density increased duration of life. If these conditions are const. race *A* lives longer than race *B*. A. D. H.

Traumatic fat necrosis. M. B. Copperman and D. R. Meranze (Surgery, 1938, **4**, 103—110).—A case of traumatic fat necrosis of the buttock is recorded. Fatty acids and glycerol produce the characteristic histological picture. G. K. H.

Resorption of amyloid substance in man. D. B. I. Migounow (Arch. int. Méd. éxp., 1938, **13**, 437—447).—Intravenous injection of staphylococci in rabbits results in amyloid production in the spleen, liver, and kidney; the deposition is preceded by appearance of crystals in the liver only. Resorption of amyloid by giant cells occurred in the spleen of animals previously injected with antistaphylococcal vaccine. The amyloid in the neighbourhood of the giant cells changed its chemical nature as shown by staining reactions. In a patient with hydatid cyst of the lung who died in spite of drainage of the cyst, amyloid was found in the spleen, liver, and, kidney. It was undergoing resorption in the spleen and liver owing to the presence of giant cells. The resorption was attributed to the previous pus drainage. P. C. W.

Occurrence of coproporphyrin-III. C. Rimington (Z. physiol. Chem., 1939, **259**, 45—47).—The bones of cattle with congenital porphyrinuria contain uroporphyrin-I and -III, whilst the urine contains coproporhyrin-I and -III, the ratio of the two latter being 27·6 : 1. J. N. A.

Density of animal tissues. C. Tsai and C. Y. Lin (Chinese J. Physiol., 1939, **14**, 39—50).—Of various organs of the frog, rabbit, and cat, bone had the highest and brain the lowest density as measured by Archimedes' method. Stimulation of the frog's gastrocnemius decreased its density; protein feeding increased the density of the cat's liver; starvation reduced that of rabbit's skeletal muscle and liver. N. H.

Ash constituents of Australian fish. F. W. Clements and R. C. Hutchinson (Austral. J. Exp. Biol., 1939, **22**, 89—92).—The moisture, ash, K, P, Na, Mg, Ca, Fe, Cu, and Mn contents of 45 varieties of Australian fish were determined. D. M. N.

Submicroscopic structure of dental enamel. J. Thewlis (Proc. Roy. Soc., 1939, **B**, **127**, 211—223).—Photomicrographs and *X*-ray diffraction photographs of human deciduous enamel show that each prism is composed of apatite crystallites. There are two groups of crystallites arranged so that their hexagonal axes make angles of approx. 5° and 40° respectively with the direction of the prism. Both groups are generally present in the prism, the 5° group predominating. The 40° group is sometimes absent. Variations occur in the degree of perfection of the cryst. orientation. F. B. P.

Human enamel-protein. P. Pincus (Biochem. J., 1939, **33**, 694—696; cf. A., 1937, III, 56).—The protein contains N 12·1, S 1·2, and Ca 2%. It is more resistant to attack by aq. Na_2S, KCN, and Na thioacetate and to subsequent attack by trypsin and pepsin than are horn, hoof, hair, and wool. W. McC.

Porphyrins of feathers. O. Völker (Z. physiol. Chem., 1939, **258**, 1—5; cf. Derrien, Bull. Soc. Chim. biol., 1929, **45**, 689).—The fluorescence produced by

illumination with ultra-violet light indicates that the feathers of 13 natural orders contain porphyrin. Except in bustards and, to a smaller extent, owls, the amounts are very small. The feathers of *Lophotis r. ruficrista*, *L. r. gindiana*, and *Lissotis melanogaster* yield the tetramethyl ester of coproporphyrin-III when extracted with methyl alcohol saturated with HCl, HCl being subsequently passed at 0° into the solution of the pigment in methyl alcohol. The ester is purified by adsorbing twice on Al_2O_3 and eluting with ether-methyl alcohol. The feathers of the tawny owl contain protoporphyrin in addition to coproporphyrin-III, but those of other birds contain only the latter. The fæces of bustards and owls contain coproporphyrin. W. McC.

Lipins of sheep skins. II. Effects of pullery processes on the lipins. R. M. Koppenhoefer (J. Amer. Leather Chem. Assoc., 1939, **34**, 240—250; cf. A., 1939, III, 498).—Lipins of the epidermal, corium, and subcutaneous tissue divisions are examined after curing, painting, and liming. Of the epidermal lipins 10·7% were removed during soaking and 33·7% during wool pulling; only 50% remained in the limed skin. There was no loss of corium lipins. Cholesterol, cholesteryl ester, and waxes remained unchanged chemically, but 15% of epidermal cholesterol and 30% of epidermal wax were removed during the liming process. The phospholipins were considerably hydrolysed during curing and the residue was hydrolysed during the painting process. The free fatty acids increased during curing but were partly converted into soaps during painting, and completely converted during liming. Less than 3% of the corium triglycerides were hydrolysed during the several processes. D. P.

Change of Arakawa's reaction and of inorganic sulphate content of human milk on antiluetic treatment. K. Yoshino (Tohoku J. exp. Med., 1938, **34**, 319—330).—On antisyphilitic treatment the milk of the mother changes from an Arakawa-negative reaction to a positive one if there is a sufficient supply of vitamin-B_1 in the body; the inorg. SO_4'' decreases to the normal level. F. Ja.

Arakawa reaction and urea content in human milk and blood. G. Sugihara (Tohoku J. exp. Med., 1938, **34**, 331—338).—The urea content of human milk is almost equal to that of the blood and independent of the Arakawa reaction. F. Ja.

Periodic occurrence of methylglyoxal-like substance in human milk and periodic weakening of Arakawa's reaction. Influence of menstruation on human milk. S. Sato and S. Isono (Tohoku J. exp. Med., 1939, **35**, 323—334).—Vitamin-*C* given in large doses has no effect on the Arakawa reaction of human milk. Arakawa-positive milk becomes -negative during menstruation; the glyoxalase content of milk rises simultaneously. E. R.

Influence of vitamin-*C* on Arakawa's reaction. S. Isono (Tohoku J. exp. Med., 1939, **35**, 335—360).—Administration of vitamin-*C* to the mother does not change the Arakawa reaction of the milk. Addition of 0·3 mg. of -*C* to 1 c.c. of milk *in vitro* makes Arakawa-positive milk negative. E. R.

Hæmosedimentation of healthy lactating women. Y. Kokubo (Tohoku J. exp. Med., 1939, **35**, 361—373).—339 lactating women were examined. In most of them the sedimentation rate was increased, more in those secreting Arakawa-negative milk than in those secreting -positive milk. E. R.

Influence of vitamin-*B* and yakitron on methylglyoxal-like substance in Arakawa-negative mother's urine. R. Orimo (Tohoku J. exp. Med., 1939, **35**, 374—383).—Women with Arakawa-negative milk excrete a methylglyoxal-like substance in their urine. The excretion of this substance diminishes when vitamin-B_1 or yakitron, or both together, are given to the mother. E. R.

Chemistry of animal poisons. D. von Klobusitzky (Österr. Chem.-Ztg., 1939, **42**, 185—190).—A review, mainly of snake and toad poisons. F. O. H.

Bee poison. V. Simple, chemical separation of the two toxic components. G. Hahn and M. E. Fernholz (Ber., 1939, **72**, [*B*], 1281—1290).—Bee poison is a salt-like compound of an unstable, feebly acidic component I which causes cramp and appears to contain much P and a more complex, feebly basic component II which appears stable when dry and gives the protein reactions. Union of the components to the salt considerably enhances the stability of component I. In water the salt is hydrolysed. The native poison is favoured by H ions so that picric acid ppts. the total poison. Alkali causes fission into the components, which is quant. when the conc. solution is saturated with NH_3 at 0°. The salt is sol. in water only with partial hydrolysis and a small addition of acid is necessary to prevent pptn. of component II. The small amount of formic acid in the poison droplet probably serves this purpose. Attempts to purify component I further through its salts are described. Brucine yields three *compounds*, m.p. 162°, 272—273°, and decomp. 178—180° respectively, all of which are derived from admixed matter. The unfractionated material gives a *picrate* decomp. 270°, and a *hydrochloride* m.p. 180°; Br in AcOH affords a *Br*-derivative decomp. >210°. Further *picrates* I, II, and III, decomp. 187°, 272—273°, and 277—278° respectively, have been isolated in amount too small to permit the corresponding free bases to be isolated. H. W.

(xvii) TUMOURS.

Relative potency of carcinogenic compounds. J. Iball (Amer. J. Cancer, 1939, **35**, 188—190).—An index of potency is calc. from % of tumours produced ÷ 100 × latent period in days. 9 : 10-Dimethyl-1 : 2-benzanthracene (potency 151), methylcholanthrene (potency 80), and 3 : 4-benzpyrene (potency 75) are the most active compounds. E. B.

Production of a hepatic tumour by 3 : 4-benzpyrene in rats. C. Oberling, P. Guérin, and M. Guérin (Compt. rend. Soc. Biol., 1939, **130**, 417—419).—A transplantable sarcoma was produced 1—2 years after implantation of 3 : 4-benzpyrene. H. G. R.

Experimental epithelioma in man. T. Gordonoff and B. Walthard (Schweiz. med. Wschr.,

1939, 69, 381—382).—An epithelioma of the skin was observed in a subject engaged in experimental cancer production in animals with methylcholanthrene. The tumour had the same histological properties as early squamous epithelium cancers observed in mice. A. S.

Carcinoma of kidney in rats treated with beta-anthraquinoline. A. Sempronj and E. Morelli (Amer. J. Cancer, 1939, 35, 534—537).—11 rats were injected with 8—10 mg. of β-anthraquinoline (5 : 6-2′ : 3′-naphthaquinoline). 8 animals died during the following 11 months. Of these, one showed cystic nephritis in both kidneys with 2 adenocarcinomatous nodules in the right kidney; another had a small adenocarcinoma in the left kidney; 4 other rats showed cystic nephritis but no tumours. F. L. W.

Production of lung tumours in mice by intratracheal administration of carcinogenic hydrocarbons. M. B. Shimkin (Amer. J. Cancer, 1939, 35, 538—542).—Primary lung tumours were produced in over 90% of mice of a susceptible strain within 4 months after intratracheal injection of 0·1 mg. of 1 : 2 : 5 : 6-dibenzanthracene or methylcholanthrene dispersed in horse serum-cholesterol. Although as many mice developed lung tumours after intratracheal as after intravenous injection, the total no. of tumours was significantly greater in the latter. The intratracheal route is not as convenient or as efficacious as the intravenous. F. L. W.

Reponse of central nervous system to application of carcinogenic hydrocarbons. I. Dibenzanthracene. J. H. Peers (Amer. J Path., 1939, 15, 261—272).—Cholesterol pellets containing 5% of 1 : 2 : 5 : 6-dibenzanthracene when implanted into the brains of 81 albino mice produced brain laceration followed by a marked phagocytic microglial response which removed the debris in 30 days; a collagenous capsule then formed around the pellet. In 40 animals which survived long enough, 1 extracranial malignant spindle-cell tumour was found, originating on the surface of the pellet. (4 photomicrographs.) C. J. C. B.

Chemoantigens and carcinogenesis. W. R. Franks and H. J. Creech (Amer. J. Cancer, 1939, 35, 203—212).—Of 30 mice immunised with 1 : 2 : 5 : 6-dibenzanthranylcarbamidocasein antigen and subsequently injected with dibenzanthracene, 2 developed tumours at the site of injection of the latter. 10 out of 32 control mice injected with dibenzanthracene alone developed tumours. Of 24 immunised mice in which the antigen had been treated with K alum 7 developed tumours at the site of the antigen injection; injection of the untreated antigen produced 3 tumours in 12 mice. E. B.

Vitamin-*E* and experimental tumours. C. Carruthers (Amer. J. Cancer, 1939, 35, 546—553).—Vitamin-*E* concentrate prepared from cottonseed oil and administered to mice had no significant effect on the carcinogenic action of methylcholanthrene injected in lard or spermaceti solution. Whilst most other investigators report sarcomas, approx. 30% of the tumours induced by the carcinogen were epidermoid carcinomas. The incidence of spontaneous mammary tumours in the females of a susceptible strain was very much lower on a diet deficient in -*E*. Whether this is due to lack of -*E* or to some other dietary influence has not yet been determined. F. L. W.

Production of transplantable carcinoma and sarcoma in guinea-pigs by injections of thorotrast. L. Foulds (Amer. J. Cancer, 1939, 35, 363—372).—20 young female guinea-pigs were injected with 4 doses of 0·2—0·3 c.c. of thorotrast (a prep. of ThO_2) into the base of a nipple. In 9 animals surviving 7 months, 3 sarcomas and 1 carcinoma developed with an average induction period of 37 months. E. B.

Effect of diet on tumours induced by ultraviolet light. C. A. Baumann and H. P. Rusch (Amer. J. Cancer, 1939, 35, 213—221).—The rate of production of tumours in albino mice by ultra-violet irradiations varied with the diet. High fat increased the incidence, brain extract and liver reduced it. 2% of cholesterol had no effect on tumour incidence, but increased liver-fat and -cholesterol. E. B.

Carcinogenic and related non-carcinogenic hydrocarbons in tissue culture. I. E. M. H. Creech (Amer. J. Cancer, 1939, 35, 191—202).—1 : 2 : 5 : 6-Dibenzanthracene–choleic acid increased cell proliferation when added to mouse fibroblasts in tissue culture. Methylcholanthrene–choleic acid and 1 : 2 : 5 : 6-dibenzanthracene–choleic acid caused precocious splitting of the chromosomes and occasional reduction divisions. Phenanthrene–choleic acid, acenaphthene–choleic acid, and deoxycholeic acid did not have these effects. E. B.

Carcinogens and planarian tissue regeneration. S. E. Owen, H. A. Weiss, and L. H. Prince (Amer. J. Cancer, 1939, 35, 424—426).—Saturated aqueous solutions of 1 : 2 : 5 : 6-dibenzanthracene, methylcholanthrene, 3 : 4-benzpyrene, and nicotinic acid stimulated the normal regeneration and reproduction of *Euplania dorotocephala*. E. B.

Vitamin-*A* and liver cell tumours. A. Goerner and M. M. Goerner (J. Biol. Chem., 1939, 128, 559—565).—Livers of rats fed on a diet containing 0·1% of 2-amino-5-azotoluene for 1 year showed diminished vitamin-*A* compared with normals, whilst the hepatomas produced by the diet showed absence of -*A*. T. F. D.

Determination of iron in lymph glands of mice during treatment with a carcinogenic compound. F. L. Warren (Biochem. J., 1939, 33, 729—733).—The Fe content of the lymph glands of mice repeatedly injected with the water-sol. carcinogenic compound 1 : 2 : 5 : 6-dibenzanthracene-9 : 10-*endo*-αβ-succinate may reach a level 5 times the normal. The fact that the Fe content 3 weeks after cessation of injections is lower than after 24 hr. suggests that part of the additional Fe is in some labile form. A similar process may occur in mice which develop spontaneous tumours. P. G. M.

Association of carcinogenicity and growth-inhibitory power in the polycyclic hydrocarbons and other substances. A. Haddow and A. M.

Robinson (Proc. Roy. Soc., 1939, **B**, **127**, 277—287).—The substances were tested for their action on the growth of the Walker rat carcinoma 256, the Crocker mouse sarcoma 180, and spontaneous mammary cancer of the mouse. 86·5% of 171 experiments with 34 carcinogenic substances showed growth inhibition; 79·6% of 79 experiments with 34 non-carcinogenic compounds gave no inhibition. It is concluded that carcinogenicity and growth-inhibitory power are closely associated. F. B. P.

Influence of Roentgen radiation on immunity to Shope fibroma virus. J. Clemmesen (Amer. J. Cancer, 1939, **35**, 378—385).—Rabbits which had been exposed to general *X*-radiation (330—770 r.) showed a reduced resistance to the Shope fibroma virus; the development of immunity to the virus was also delayed. E. B.

Sarcoma 37 and virus problem. W. H. Woglom (Amer. J. Cancer, 1939, **35**, 374—377).—Of 58 mice with benzpyrene lesions, 30 were injected with sarcoma 37 frozen or unfrozen, and 28 were left as controls. In no instance was the benzpyrene lesion stimulated. E. B.

Comparison of effect of homologous tumour material and Duran-Reynals factor on tumour growth. A. E. Casey (Amer. J. Cancer, 1939, **35**, 354—362).—Previous injection of homologous tumour material increased the susceptibility of rabbits to the Brown–Pearce tumour. Testicle extracts containing the Duran–Reynals diffusing factor had no such effect. E. B.

Experimental epithelioma of the stomach. Intracutaneous immunisation. A. Besredka and L. Gross (Ann. Inst. Pasteur, 1939, **62**, 253—259).—The stomachs of rabbits were easily infected with the Brown–Pearce epithelioma. Metastases were present in the internal organs. Intracutaneous inoculation produces local tumours which resorb and leave a solid immunity against experimental infection of the stomach. G. P. G.

Correlation between epithelia and blood-vessels and the structure of organs and genesis of neoplasms. E. Remotti (Boll. Soc. ital. Biol. sperim., 1939, **14**, 106—108).—A discussion, based on histological observations of the yolk sac. F. O. H.

Case of metastasising carcinoma in mouse produced by autotransplantation. H. Heide-Jørgensen (Amer. J. Cancer, 1939, **35**, 264—268).—Single autotransplantation of lactating mammary tissue in a 4-months old albino mouse produced a carcinoma. E. B.

Changes in the nature of the stroma in vagina, cervix, and uterus of the mouse produced by long-continued injections of œstrogen and by advancing age. L. Loeb, V. Suntzeff, and E. L. Burns (Amer. J. Cancer, 1939, **35**, 159—174; cf. A., 1939, III, 262).—Repeated injection of œstrogen up to 100 rat units weekly into mice increased the amount of fibrous-hyaline material deposited in the stroma of the vagina, cervix, and uterus and produced a rarefaction of the stroma. E. B.

Malignant tumour of thymus in a rabbit. J. W. Orr (Amer. J. Cancer, 1939, **35**, 269—274).—The tumour arose spontaneously in a 4-year-old rabbit; metastases were present in heart, lung, and lymph nodes. E. B.

Functional activity of the mammary gland of the rat in relation to mammary carcinoma. H. J. Bagg and F. Hagopian (Amer. J. Cancer, 1938, **35**, 175—187).—Rapid breeding and prevention of suckling in 56 female Wistar rats increased the incidence of mammary adenocarcinoma to 14% and adenoma to 20%. Leiomyoma of the uterus occurred in 5 of the rats. E. B.

Breast and lung carcinoma in "*A*" stock mice. J. J. Bittner (U.S. Publ. Hlth. Repts., 1939, **54**, 380—392).—Data on the primary breast- and lung-tumour ratios in the inbred "*A*" strain of mice show that (1) the breast-tumour incidence is high in breeding females and low in virgin females, and (2) the lung-tumour incidence is high in virgin females and breeding males and low in breeding females. Diet, *per se*, may influence the breast-tumour incidence primarily through the physical condition of the individuals in determining the no. reaching the cancer age. C. G. W.

Cancer growth and pregnancy in mice. H. Baatz (Z. Geburtsh. Gynäk., 1938, **118**, 124—162).—Growth of spontaneous and inoculated tumours in mice is inhibited in the last 3rd of pregnancy; it is stimulated in the post-partum period when metastases are particularly frequent. S. Sch.

Chemotherapy of cancer. III. Independence of tissue respiration and glycolysis, and the growth rate of tumours. E. Boyland and M. E. Boyland (Biochem. J., 1939, **33**, 618—621; cf. A., 1938, III, 1021).—The mean rates of growth (increase in average diameter) of 8 strains of transplanted mouse tumour were 0·01—1·35 mm. per day. Respiration and glycolysis in isolated tumour tissue varied much less than, and the variations were not parallel to, the growth rate. The glycolysis and respiration of tissue from grafted tumours, the growth of which was inhibited by administration of 1 : 2 : 5 : 6-dibenzanthracene and -fluorene, Na sulphanilylsulphanilate, α-nitroso-β-naphthol, and 2 : 2′-dinitro-4 : 4′-diaminodiphenylmethane, did not differ significantly from that of tissue from untreated tumours. The inhibition of growth produced by trypan-blue was accompanied by decrease in respiration and glycolysis, whilst that produced by 4 : 4′-diaminodiphenylsulphoxide was accompanied by slight decrease in glycolysis. No inhibition of tumour growth or metabolism resulted from injection of isamine-blue. W. McC.

Synergistic effect of heptaldehyde and methyl salicylate on spontaneous tumours of the mammary gland in mice. L. C. Strong (Yale J. Biol. Med., 1939, **11**, 207—218).—3 parts of heptaldehyde and 1 part of synthetic methyl salicylate were added to the diets of tumour-bearing mice. 20 out of 45 mice so treated showed a pronounced diminution in the size of their tumours. The original tumours in 12 disappeared, of which 9 lived in normal health

following the regression and there was no recurrence; the remaining 3 mice when later placed on the control diet had recurrences at the sites of the original tumours. The average growth rate of tumours in all treated animals was lower than that in the control animals, and the treated animals lived longer than the controls. A. G. M. W.

Liquefaction of spontaneous tumours of mammary gland in mice by heptaldehyde. L. C. Strong (Amer. J. Cancer, 1939, **35**, 401—407).—Administration of heptaldehyde to mice as an addition to the diet caused liquefaction and inhibition of growth of spontaneous mammary tumours and increased the survival time of the mice. Small tumours were more affected than large ones. E. B.

Influence of dichlorophenol-indophenol on human cancer tissue. H. Rotter (Z. Vitaminforsch., 1938—1939, **8**, 323—326).—When 2 : 6-dichlorophenol-indophenol is injected into nodules of an epithelial cancer the dye is rapidly reduced possibly by ascorbic acid of tumour tissue. Repeated injections of the dye cause the nodules to grow smaller and reduction of the dye is delayed. Treated nodules show degeneration with vacuolisation, fragmentation, karyorrhexis, and karyolysis. After 14 days' treatment no cancer tissue can be seen. The destruction of the cells is considered to be due to the effect on their respiration of the system 2 : 6-dichlorophenol-indophenol–ascorbic acid. J. N. A.

Experimentally induced benignancy of neoplasm. II. Effect of œstrogen and castration of host. I. T. Nathanson and W. T. Salter (Arch. Path., 1939, **27**, 828—840).—Pedigree mice were artificially immunised against sarcoma 180 by preliminary inoculation into the tail. Immunity was enhanced by large doses of œstrin, given while the test tumours were developing. In non-immune animals, strain *C*57, the rate of growth of the implanted tumours was slowed by œstrin, but no effect was found in strain *A*, so that the œstrogen probably acted by enhancing a primary inhibiting mechanism and not by direct action on the tumour. Castration of females had little effect. C. J. C. B.

Influence of tar products on growth and morphological picture of *in vitro* cultures of iris epithelium. M. Maeda (Folia pharm. Japon., 1936, **22**, [Brev. 74], 80—86).—Wood tar, pityrol, neopityrol, ichthyol, thigenol, and NH_4 tumenol in small concns. increased and in larger concns. decreased growth. Ch. Abs. (*p*)

Resistance to experimental cancer. F. G. Banting (Proc. Roy. Soc. Med., 1939, **32**, 245—254).—Work on the experimental tumour is reviewed. Specificity is the most outstanding feature of cancer and resistance to cancer is even more sp. "Resistance," or refractoriness of the grafted cells, must be distinguished from "immunity," a condition in which the animal is able to combat the agent causing the disease. It appears that "resistance" is a laboratory phenomenon, which is distinct from natural spontaneous cancer, and may simply be an indication of a reaction between the host and tumour cells where a difference in genetic constitution exists between these. Thus the forces which destroy a transplanted tumour could not operate in natural cancer, in which the malignant cells have the same genetic constitution as the host. The forces which rid an animal of a spontaneous tumour may be a combination of anti-cellular and anti-viral immune bodies; regression of the Fujinami tumour in ducks, and of the Shope rabbit papilloma, may be examples of the development of immune bodies which destroy the virus. Kidd attributes the self-cure of the virus-induced papilloma to a generalised resistance originating in the host, elicited by and directed against the virus-infected cells. That antigenic differences between host and malignant tissues may provoke certain curative antibodies capable of causing the disappearance of even spontaneous cancers holds out most hope for cancer therapy. W. J. G.

Treatment of experimentally induced cancer with protozoan endotoxins. G. Roskin and K. Romanova (Arch. int. Méd. exp., 1938, **13**, 379—384).—If *Schizotrypanum cruzi* is injected into mice or rats at the same time as a tumour is inoculated that gives a 100% mortality at least 50% of the animals survive. The trypanosomes usually accumulate in the lymph glands, bone marrow, and spleen, but when injected into an animal with a tumour they all accumulate in the tumour tissue and lead to a degeneration of the growth. Other similar trypanosomes are ineffective. The endotoxins extracted from the organisms are equally effective and if the piece of tumour to be inoculated is suspended for 6 hr. in serum containing the endotoxins less than 10% of the inoculations take, while pieces suspended in normal serum take in 100% of cases. P. C. W.

Action of glucose on tar-tumours in mice. K. A. Vannfält (Upsala Lakfören. Förh., 1937—1938, **43**, 267—412).—Administration of 50% glucose solution to tar-treated mice reduced the size of tumours and no. of metastases and increased the length of life of animals. Adenomata of the lung were common in glucose-treated animals. Insulin injection decreased length of life. E. B.

Transamination and dehydrogenation of glutamic acid by extracts of Jensen sarcoma. H. von Euler and G. Günther (Naturwiss., 1939, **27**, 214—215).—Extracts of Jensen sarcoma promote the transfer of the amino-group of *l*- but not of *d*-glutamic acid to oxalacetic acid (cf. Kritzmann, A., 1938, III, 931). In presence of cozymase, flavin enzyme, and sarcoma extract, *l*- but not *d*-glutamic acid is dehydrogenated. Hence the existence of a *d*-glutamic acid apodehydrogenase is improbable. W. O. K.

Radioactivity of potassium in tumour tissue. A. Lasnitzki (Amer. J. Cancer, 1939, **35**, 225—229).—Radiations produced by K from tumour tissue (Jensen rat sarcoma), rat muscle, and mineral K were not appreciably different. The concn. of the radioactive isotope is therefore about the same in K from these sources. E. B.

Effect of freezing *in vitro* on transplantable mammalian tumours and normal rat skin. G. B. Mider and J. J. Morton (Amer. J. Cancer, 1939, **35**, 502—509).—Walker rat carcinoma 256 and

mouse sarcomas 180 and 37 grew on subcutaneous transplantation after exposure to −74° *in vitro*. The effects of the rate of freezing, duration of the frozen state up to 24 hr., the no. of repeated freezings and thawings, and the physical state of the tumour are discussed. The squamous epithelial and connective-tissue cells of normal adult rat skin may grow after freezing to −74°. F. L. W.

Contorted mitosis and the superficial plasmagel layer [in sarcoma]. W. H. Lewis (Amer. J. Cancer, 1939, **35**, 408—415).—The controlled mitoses observed in tissue cultures of sarcoma 37 may be due to changing bands of contraction in the plasmagel layer of the cells. E. B.

Complex malignant mammary tumour. G. R. Tudhope (J. Path. Bact., 1939, **48**, 499—506).—A complex malignant mammary tumour is described which contained areas of fibro-adenomatous, carcinomatous, and apparently sarcomatous structure, together with nodules resembling cartilage. It is suggested that in an intra-canalicular fibro-adenoma malignant transformation of the epithelial component led to diffuse carcinomatous infiltration of the stroma in which mucinoid degeneration was followed by the development of an epithelial pseudo-cartilage and by the formation of true cartilage and osteoid tissue by metaplasia of the stromal cells. (12 photomicrographs.) C. J. C. B.

Examination of effusions in tumour cases. K. E. Lande (J. Lab. clin. Med., 1939, **24**, 685—689).—The findings in 27 cases are discussed. C. J. C. B.

Selective action of urine and serum, from patients with malignant tumours, on embryonal and newly growing tissues. T. H. Elsasser and G. B. Wallace (Science, 1939, **89**, 250—251).—The urine and blood serum of patients with malignant tumours (dysgerminoma of the ovary, teratoma of the testicle, and the Wilms tumour) have a selective destructive action on embryonal or newly growing tissue in rabbits and rats, produce abortion in pregnant animals, and produce degenerative processes in the sex glands. W. F. F.

Congo-red test in carcinoma. W. Schröder (Klin. Woch., 1939, **18**, 248—251).—The test has no diagnostic val. E. M. J.

(xviii) NUTRITION AND VITAMINS.

Interrelation of soils and plant, animal, and human nutrition. E. C. Auchter (Science, 1939, **89**, 421—427).—An address. L. S. T.

Adaptation and nutrition. C. von Noorden (Dtsch. med. Wschr., 1939, **65**, 745—748, 795—799, 844—848).—A review. A. S.

Nutrition of infants. K. Hoffmeier (Dtsch. med. Wschr., 1939, **65**, 665—668, 715—717).—A lecture. A. S.

Food consumption of 104 families in Paco district, Manila. M. Guttierrez and F. O. Santos (Philippine J. Sci., 1938, **66**, 397—416).—The character, nutrient val., and cost of foodstuffs consumed by families of different classes are discussed. A. G. P.

Nutrition of farm animals. K. Scharrer (Chem.-Ztg., 1939, **63**, 225—229, 247—248).—The importance of the mineral, protein, and vitamin contents of feeding stuffs is discussed. Numerous analyses of ash constituents of common cattle foods are recorded. A. G. P.

Hair growth in young albino rats in relation to body size and quantity of food. E. O. Butcher (J. Nutrition, 1939, **17**, 151—159).—The time of appearance of second growth of hair was not affected by the size of the rats at weaning (22—55 g.) provided they were well fed, but was delayed when the young rats were underfed after weaning. A. G. P.

Nutritive value of milk. H. Chick (Dairy Ind., 1939, **4**, 166—167).—A review. W. L. D.

Long-time study of nitrogen, calcium, and phosphorus metabolism on (A) a low-protein diet, (B) a medium-protein diet. (A) B. L. Kunerth and M. S. Pittman. (B) M. S. Pittman and B. L. Kunerth (J. Nutrition, 1939, **17**, 161—173, 175—185).—(A) Irregular variations occurred in N, Ca, and P retentions of 3 young women over a 45-day period. On a low-protein diet in which meat supplied 85% of the total protein the average N balance for 15 consecutive 3-day periods was positive in all cases. In a diet containing 75% of the normal protein requirement, levels of 92 and 97% of the commonly accepted standards (0·68 g. Ca, 1·32 g. P per 70 kg.) of Ca and P respectively failed to prevent losses in each of the subjects. Variations in retention of Ca and P were parallel but P was the better utilised.

(B) Variations in N, Ca, and P retention occurred during medium-protein feeding. With a diet providing 1·2 g. of protein (87% from beef) and 40—45 kg.-cal. per kg. positive N and P balances were maintained. Ca balances were negative throughout but retention exceeded that observed on a low-protein diet. Utilisation of N, Ca, and P was greater on a medium- than on a low-protein diet. A. G. P.

Biological value of the proteins of rice and its by-products. M. C. Kik (Cereal Chem., 1939, **16**, 441—447).—The growth-promoting vals. of whole and polished rice, bran, and polishings were compared by growth tests on rats. The biological vals. of the proteins are respectively 72·7, 66·6, 84·9, and 82·9 at a 5% protein level, compared with 81·5 for casein. T. M.

Standardisation of tikitiki extract. A. J. Hermano and P. J. Aguila (Philippine J. Sci., 1938, **67**, 335—349; cf. B., 1933, 444; 1934, 377).—Samples of rice bran (tikitiki) extract vary considerably in chemical composition. In rats suffering from beriberi, a daily dose of 10 mg. of vitamin-B_1, 40—50 mg. of the extract, or 0·725 g. of crude rice bran does not produce a complete cure or an increase of 3 g. weekly in wt. 0·05 c.c. of the extract daily produces complete and rapid cure and an average weekly gain in wt. of 3·34 g. W. McC.

Treatment of obesity and leanness. R. Boller (Wien. klin. Wschr., 1939, **52**, 530—534).—A lecture. A. S.

Fat-free diets. G. J. Martin (J. Nutrition, 1939, **17**, 127—141).—Rats on a fat-free diet resumed normal growth when given a daily supplement of 30 mg. of methyl linoleate. Methyl linolenate cannot supplement the linoleate. With a highly purified synthetic diet containing all known dietary essentials rats showed a growth response to supplements of brain tissue and liver. A. G. P.

Rat acrodynia and essential fatty acids. F. W. Quackenbush, B. R. Platz, and H. Steenbock (J. Nutrition, 1939, **17**, 115—126).—A basal diet of purified casein, glucose, and salts, supplemented with carotene, calciferol, synthetic vitamin-B_1, and riboflavin, induced dermatitis in rats, and a "rat-acrodynia" when sub-curative amounts of fat were added. Supplementary feeding of peanut or wheat-germ oil effected a complete cure. Neither aëration nor ultra-violet irradiation destroyed the activity of peanut oil. The active substances in the oil occurred in the fatty acid fraction, max. potency being associated with portions crystallising from acetone between −50° and −75°. Ethyl linoleate (0·5 drop) completely cured the dermatitis. The ethyl ester of elaidinised linoleic acid was inactive. A. G. P.

Production of seborrhœa in rats by feeding with whale oil. II. E. Somekawa (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1938, **35**, 121—129; cf. A., 1933, 1072).—Neither cetin nor hydrogenated sperm or arctic-sperm oil produces seborrhœa in rats; hydrogenation reduces the toxicity of the oils. The oil exuded by rats with seborrhœa contains esters of cetyl and oleyl alcohols with an unsaturated C_{22} acid. A. Li.

Regulation of glyconeogenesis. L. Stein, E. Tuerkischer, and E. Wertheimer (J. Physiol., 1939, **95**, 356—364).—A fat-rich but practically carbohydrate-free diet acts as a stimulus of glyconeogenesis (rat); the addition of 30% of carbohydrate prevents this effect; the stimulus is not so great as that obtained with a protein-rich diet; acidosis is not a cause of new sugar production. In starvation the basis of metabolism is transferred from carbohydrate to fat or protein; this change is the stimulus of new sugar production and constitutes an important link between carbohydrate consumption and production. Starvation or exposure to cold, after a protein-rich diet, produces a lower liver-glycogen content in thyroidectomised than in normal rats, but after a carbohydrate diet the reverse is found; the thyroid exerts a direct but restricted influence on glyconeogenesis. Heart-glycogen of thyroidectomised rats is higher than in normal animals. (Cf. A., 1938, III, 321.) J. A. C.

Nutritive value of wheaten products. N. Palmer (Biochem. J., 1939, **33**, 853—858).—A diet composed entirely of wheat cereals is satisfactory for continued growth of young rats provided that Ca lactate is added in order to increase the Ca : P ratio to 1 : 0·5. Ca citrate is as effective as the lactate, but $CaCO_3$ and $CaCl_2$ are inferior in this respect. Milk and its products, therefore, represent a satisfactory complement to cereals along with, in the case of man, ascorbic acid-containing foods. P. G. M.

Analysis and differentiation of composition of iron, phosphorus, and calcium compounds in respect of nutritional requirements. I. Introduction. J. C. Drummond. **II. Ionisable and available iron in foods.** R. A. McCance. **III. Phosphorus compounds in relation to nutrition.** H. D. Kay. **IV. Calcium compounds in relation to nutrition.** E. C. Dodds and J. D. Robertson (Analyst, 1939, **64**, 332—335, 335—336, 336—338, 338—339).—I. The inadequacy of analytical data as a guide to the amounts of utilisable Fe, Ca, and P in foods is indicated.

II. Methods of determining ionisable Fe and available Fe are reviewed, and the possible relation between the two is discussed.

III. A review.

IV. Methods of studying Ca balance in clinical research are discussed. E. C. S.

Influence of calcium and phosphorus intake on tooth formation. W. E. Gaunt and J. T. Irving (J. Physiol., 1939, **95**, 51—52P).—The basal diet for rats contained 0·028% of Ca and 0·066% of P, and from this four experimental diets were made up by the addition of Ca lactate and Na_2HPO_4; diets contained respectively 0·08, 0·12, 0·20, and 0·30% of Ca and P. With a Ca : P ratio of 1, only at a level of 0·3% of Ca and P in the diet are histologically sound teeth invariably produced; at the two lowest levels of intake, the predentin is abnormally wide and vascular inclusions are present. J. A. C.

Zinc in nutrition. Spectrographic analysis. F. I. Scoular (J. Nutrition, 1939, **17**, 103—113).—In balance studies with boys of pre-school age 0·04—6·0% of ingested Zn (spectrographic determinations) was eliminated in the urine, the proportion being unrelated to the Zn intake. Fæcal Zn (42% upwards) was unrelated to the level of urinary Zn; vals. tended to be high with high levels of ingestion, although no uniform relation was apparent. The average Zn requirement was 0·307 mg. per kg. body-wt. A. G. P.

Pig-feeding experiments with cod-liver oil. A. S. Foot, K. M. Henry, S. K. Kon, and J. Mackintosh (J. Agric. Sci., 1939, **29**, 142—163).—Pigs receiving a ration of barley meal–weatings–soya-bean meal–meat meal with minerals showed symptoms of vitamin-A deficiency and failed to fatten. Addition of 0·5% of cod-liver oil to the ration corr. this condition. The reserve of -A in livers of young pigs was exhausted soon after weaning. Deficient pigs showed no clinical symptoms of rickets; the breaking strength of femurs and the serum-Ca and -P were the same as in pigs receiving oil although the ash content of the ribs was somewhat low. A. G. P.

Vitamin-A and the Reid Hunt reaction. E. Altenburger and H. Wendt (Klin. Woch., 1939, **18**, 418). E. M. J.

Hemeralogy and serum-vitamin-A. R. Pies and H. Wendt (Klin. Woch., 1939, **18**, 429—431).—Disorders of dark-adaptation were present when serum-vitamin-A fell below 0·4 Lovibond blue unit.

Engelking's adaptometer is more useful for these examinations than the scotopticometer of Møller and Edmund. E. M. J.

Vitamin-*A*–thyroxine antagonism. I. W. Weslaw and B. Wróblewski (Z. ges. exp. Med., 1939, **105**, 497—511).—Percutaneous application of vitamin-*A*, dissolved in sesamé oil, increases the resistance of rats to thyroxine poisoning. This effect is due to the action of the oil. Pure -*A* potentiates the action of thyroxine; thyroxine accelerates the onset of -*A* hypervitaminosis. A. S.

Effect of paraffin on the absorption of vitamin-*A*. O. Andersen (Klin. Woch., 1939, **18**, 499—502).—25% of orally administered vitamin-*A* is lost in the fæces when paraffin is given at the same time. E. M. J.

Vitamin-*A* and -*D* content of mutton bird oil. W. Davies (Austral. J. Exp. Biol., 1939, **17**, 81—84).—The vitamin-*A* content of mutton bird oil is 0·005%. "Refined" and commercial emulsions contain no -*A*. -*D* is present in negligible quantity. D. M. N.

Occurrence of carotene in oil of *Attalea gomphococca*, Mart., and its relation to vitamin-*A* potency. W. J. Blackie and G. R. Cowgill (Food Res., 1939, **4**, 129—133).—The vitamin-*A* potencies of the cortex oil of the nuts from 2 varieties of this palm were 158 and 48 I.U. per g., respectively. E. C. S.

Vitamin[-*A* and -*D*] content of certain Pacific fish oils. A. F. Morgan, L. Kimmel, and H. G. Davison (Food Res., 1939, **4**, 145—158).—From an examination of sardine and salmon offal oils, and the liver oils of varieties of salmon, bass, tuna, mackerel, and basking shark, it is concluded that there is no predictable relation between the vitamin-*A* and -*D* contents of these oils nor between the oil content of livers and the vitamin val. of the oils. E. C. S.

Vitamin-B_1 metabolism. F. Knüchel and A. H. Lemmerz (Med. Klin., 1939, **35**, 606—608).—Vitmin-B_1 balance in various types of rheumatism is normal. A. S.

Metabolism of pyruvic acid in normal and vitamin-B_1-deficient states. II. Blood-pyruvate in rat, pigeon, rabbit, and man. III. Relationship of blood-pyruvate to cardiac changes. G. D. Lu (Biochem. J., 1939, **33**, 774—786; cf. A., 1939, III, 540).—Although in vitamin-B_1-deficient rats blood-pyruvate vals. and bradycardia run parallel, the intravenous injection of pyruvate in normal rats and rabbits produces no cardiac effects. The raised blood-pyruvate level in -B_1 deficiency is not, therefore, directly responsible for the cardiac effect but is itself the result of metabolic disturbances; it may return to normal long before the pulse rate does so. P. G. M.

Vitamin-*B* complex as related to growth and metabolism in the pig. E. H. Hughes (Hilgardia, 1938, **11**, 595—612).—With a basal diet of rice screenings, purified casein, minerals, and sufficient cod-liver oil to meet vitamin-*A* and -*D* requirements, pigs developed a type of pellagra, which was corr. by addition of nicotinic acid in presence of riboflavin and thiamin. Addition of untreated yeast, whey powder, or skim milk to the basal diet produced less rapid growth than did that of riboflavin, thiamin, nicotinic acid, and the (rice bran) filtrate factor. There was a growth response to addition of riboflavin (fuller's earth whey adsorbate) to the basal diet, and also to that of filtrate factor to the basal diet + riboflavin + thiamin + nicotinic acid. Physiological effects of deficiencies of these factors are described. A. G. P.

Action of vitamin-B_1 and -B_2 on water diuresis in children. I. Gatto (Klin. Woch., 1939, **18**, 303—305).—Vitamin-B_1 has no action and -B_2 diminishes water diuresis during the first hr. of the test or after salyrgan or diuretin; diuresis is increased in the next 2 hr. E. M. J.

Superficial glossitis and hypovitaminosis-B_1. Griebel (Klin. Woch., 1939, **18**, 496—499).—A no. of cases of superficial glossitis were cured by the administration of large doses of vitamin-*C* and -B_1. E. M. J.

Action of vitamin-B_1 on mice. E. Tonutti and J. Wallraff (Klin. Woch., 1939, **18**, 535—536).—Mice suffering from beri-beri showed a negative Best's carmine test for liver-glycogen. Liver-glycogen was restored and the beri-beri cured only by the combined administration of glucose and vitamin-B_1, but not by either alone or by insulin and glucose or -B_1 in addition to these. E. M. J.

Urinary vitamin-B_1 excretion in pathological conditions. F. Sciclounoff and F. K. Bauer (Schweiz. med. Wschr., 1939, **69**, 477—479).—15—38% of 4 mg. of aneurin, subcutaneously injected, is excreted in urine within 24 hr. by normal subjects. Patients suffering from gastric ulcer excreted only 4—10%, chronic nephritics none, patients with liver cirrhosis 3—5%. The vitamin-B_1 excretion of subjects suffering from Addison's disease is higher than that in normal subjects. A. S.

Action of vitamin-*B* and -*C* in diabetics. C. Dienst, Diemer, and Scheer (Dtsch. med. Wschr., 1939, **65**, 710—715).—Administration of vitamin-*C* and -B_1 improved the carbohydrate tolerance of diabetics; the action of the vitamins was equiv. to the effect of 20 units insulin. The patients did not previously show a -*C* deficit. A. S.

Inhibition of choline-esterase by thiamin. D. Glick and W. Antopol (J. Pharm. Exp. Ther., 1939, **65**, 389—394).—Concns. of thiamin which inhibit choline-esterase activity in horse and rat serum are in excess of physiological concns. E. M. S.

Fermentation test for thiamin. R. J. Williams and E. F. Pratt (Science, 1939, **89**, 199—200).—Objections to the test, based on the fact that substances other than thiamin, especially pantothenic and nicotinic acids, affect the test, are discussed. L. S. T.

Concentration of vitamin-B_1 in rat tissues. A. S. Schultz, R. F. Light, L. J. Cracas, and L. Atkin (J. Nutrition, 1939, **17**, 143—149).—Max. retention of vitamin-B_1 in rat bodies (2 μg. per g. body-wt.) was attained with 65 μg. of -B_1 daily in the

diet. The -B_1 concn. in different organs showed considerable variations. A. G. P.

Vitamin-B_1 in cerebrospinal fluid. G. G. Villela (Science, 1939, **89**, 251).—In 30 cases of mental diseases (epilepsia, dementia praecox, and paraphrenia) an average of 2·5 μg. per 100 c.c. was found for vitamin-B_1 content of c.s.f. The method is described. W. F. F.

Free and bound vitamin-B_1 in milk. J. Houston and S. K. Kon (Nature, 1939, **143**, 558).—After incubation of raw milk or reconstituted dried milk with taka-diastase at p_H 3·7—4·0 the fluorimetric assay of vitamin-B_1 is almost doubled. Peptic digestion gives similar results even when the phosphatases of milk have been inactivated by heating. It is probable that in addition to free -B_1, milk contains a -B_1–protein complex, a view which is supported by ultra-filtration experiments. L. S. T.

Cereals as a source of vitamin-B_1 in human diets. R. R. Williams (Cereal Chem., 1939, **16**, 301—309).—Vitamin-B_1, like other vitamins, is widely distributed in all living beings, but it does not occur in quantities much above the min. necessary for growth. Its presence in the outer tissues of cereals is associated with the metabolism of the starch in the endosperm, for which reason the consumption of whole grain is desirable. T. M.

Vitamin-B_1 in soil. V. G. Lilly and L. H. Leonian (Science, 1939, **89**, 292).—Pyridine–water extracts of cultivated and uncultivated soil, when freed from pyridine and added to a nutrient medium, support the growth of *Phytophthora erythroseptica*, *Phycomyces blakesleeanus*, *Pythiomorpha gonapodioides*, *Mucor ramannianus*, and *Sordaria fimicola*, showing the presence of thiamin and its moieties in soil. Soil from a greater depth (7 ft.) still showed the presence of pyrimidine and thiamin, as revealed by the growth of the appropriate organisms, showing that leaching into underlying clay is possible. L. S. T.

Biological determination of crystalline vitamin-B_1. K. H. Coward and B. G. E. Morgan (Biochem. J., 1939, **33**, 658—662).—The determination is most accurately effected by measuring the % of pigeons cured of retracted neck provided that the response falls within the limits 20—80%, whilst the duration of the cure is not related to the dose. P. G. M.

Determination of vitamin-B_1 by the fermentation method. K. Heyns (Z. physiol. Chem., 1939, **258**, 219—237; cf. Schultz *et al.*, A., 1939, III, 287).—An apparatus for the determination is described. Increase in wt. or no. of cells of the yeast is not a measure of the effect of aneurin. Nicotinic acid should be present; it increases the amount of CO_2 produced but does not affect the sensitivity of the method. The results are not affected by altering the glucose concn., by washing the yeast or treating it with O_2, or by replacing it by yeast maceration-juice and fermentation is not accelerated by adding acetaldehyde or pyruvic acid. Adermin (-B_6), inositol, and sulphanilamide have no effect on the fermentation and indolyl-3-acetic acid has only a slight inhibitory effect. The only substances other than aneurin which activate the fermentation are cocarboxylase, 4-amino-2-methyl-5-hydroxymethylpyrimidine, and the corresponding 5-ethoxymethyl compound. Aneurin probably acts after conversion into cocarboxylase and the results of the method represent total aneurin. Yeasts exhibit great differences, probably racial, in their response. Fresh pressed yeast of low aneurin content should be used. Addition of relatively high concns. of $Mn^{\cdot\cdot}$ increases CO_2 production but decreases response to added aneurin. In the determination, material (*e.g.*, blood) is added as such, prep. of extracts being unnecessary. 0·1 μg. of aneurin can be detected. Most of the aneurin of wheat flour, blood (man, wether), kidney, and liver (pig) occurs as cocarboxylase. W. McC.

Occurrence of vitamin-B_2 (lactoflavin). III. In nutrient yeasts and yeast-vitamin extracts. J. Schormüller (Z. Unters. Lebensm., 1939, **77**, 459—466; cf. A., 1939, III, 495).—A part of the flavin of yeast extract is undialysable, being combined non-specifically with constituents of high mol. wt. In the prep. of yeast extracts, part of the esterified flavin of the yeast is hydrolysed. The min. daily requirement for man of beer-yeast as sole source of vitamin-B_2 is 70—100 g., of "vitamin-yeast" 50—80 g., and of yeast extract 40—50 g. E. C. S.

Effect of riboflavin and the filtrate factor on egg production and hatchability. S. Lepkovsky, L. W. Taylor, T. H. Jukes, and H. J. Almquist (Hilgardia, 1938, **11**, 559—591).—Certain customary poultry rations contain insufficient riboflavin to maintain good winter egg production and hatchability. Riboflavin deficiency is associated with increased liver-fat in chicken and a greenish-yellow colour in egg whites. The filtrate factor does not influence egg production or hatchability but increases resistance of chicks to dermatitis. The riboflavin and filtrate factor contents of eggs are directly influenced by those of the diet. A. G. P.

Vitamin-B_2 complex. II. Nutritive value of sugars. U. Tange and T. Kaneko. **III. Growth-promoting factor in liver extract. IV. Effect of carbohydrate on vitamin-B_2 deficiencies.** U. Tange (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1938, **35**, 47—55, 56—63, 64—72).—II. Rats fed on sucrose as the basal carbohydrate, with vitamin-B_2, develop dermatitis but if part of the sucrose is replaced by sugars containing molasses, no dermatitis results. These crude sugars do not contain flavin or -B_2 but contain two factors necessary for max. growth, one (-B_6 ?) adsorbed by acid clay from the alcoholic extract, the other remaining in solution.

III. Liver extract contains a fourth growth-promoting factor (filtrate factor) distinct from flavin, sol. in alcohol, not adsorbed by acid clay at p_H 1·4 or 3·0 nor by charcoal at p_H 2·5, partly pptd. by Ba acetate, but not by acetone or phosphotungstic acid.

IV. With lactose as basal carbohydrate (in presence of -B_1), cataract, but not dermatitis, is produced; growth is normal even in absence of -B_2 and is unaffected by addition of -B_6, flavin, or filtrate factor. With maize starch, inhibited growth and alopecia result unless both flavin and filtrate factor are added

(-B_6 being unnecessary). With sucrose, all three factors must be added to prevent dermatitis and inhibition of growth. A. Li.

Action of vitamin-B_2 and -C on X-ray leucopenia. B. Weicker and H. Bublitz (Z. ges. exp. Med., 1939, **105**, 521—531).—X-Ray leucopenia of rabbits disappears rapidly under the action of vitamin-B_2. -B_2 produced moderate leucocytosis in prophylactic experiments. -C had no effect on X-ray leucopenia. A. S.

Action of nicotinic acid amide in disturbances of fat absorption. H. Siedeck and L. Reuss (Wien. klin. Wschr., 1939, **52**, 432—433).—A patient with a gastro-enterostomy who suffered from disturbed fat absorption was cured by repeated administration of nicotinamide. A. S.

Pellagra in identical twins. F. Mainzer (Acta med. scand., 1939, **99**, 262—286).—The remarkable identity of function and simultaneous occurrence of disease in 2 sisters (identical twins) is reported. After 3 years' separation they simultaneously developed identical symptoms of pellagra, which could not be traced to dietary deficiency. C. A. A.

Nature and partial synthesis of the chick anti-dermatitis factor. D. W. Woolley, H. A. Waisman, and C. A. Elvehjem (J. Amer. Chem. Soc., 1939, **61**, 977—978).—Concentrates of the chick anti-dermatitis factor are readily destroyed by alkali, yielding β-alanine. The acidic portion (alcohol-sol. Ba salt) with $SOCl_2$ gives a product, the chloride of which combines with β-alanine ethyl ester to give a product, hydrolysed by cold NaOH–alcohol to an active substance. The filtrate factor is very similar to pantothenic acid. R. S. C.

Pantothenic acid and the filtrate (chick anti-dermatitis) factor. T. H. Jukes (J. Amer. Chem. Soc., 1939, **61**, 975—976).—Ca pantothenate prevents chick dermatitis. The pantothenic acid unit = 0·2 "filtrate factor" unit. R. S. C.

Biological comparison of synthetic and natural adermin. E. F. Möller, O. Zima, F. Jung, and T. Moll (Naturwiss., 1939, **27**, 228—229).—Synthetic adermin has a greater growth-promoting and acid-producing effect on *Streptobacterium plantarum* than the natural vitamin-B_6. 3-Hydroxy-2 : 4-dimethyl-5-hydroxymethylpyridine (hydrochloride, m.p. 254°) has a small but definite effect, whilst 4-deoxyadermin is inactive. A. Li.

Vitamin-B_6.—See A., 1939, II, 340.

Optimal and minimal vitamin-C requirements in man. H. Rietschel (Münch. med. Wschr., 1939, **86**, 811—815. A. S.

Vitamin-C requirements and hypovitaminosis-C. W. Stepp and H. Schroeder (Klin. Woch., 1939, **18**, 414—418).—A review. E. M. J.

Physiological properties of ascorbic acid. III. Effects on water balance and body composition of guinea-pigs. M. Sheppard and E. W. McHenry (Biochem. J., 1939, **33**, 655—657; cf. A., 1939, III, 402).—Lack of ascorbic acid causes diminished water retention which largely accounts for diminution of body-wt. More body-fat is retained by deficient than by normal animals. P. G. M.

Avitaminosis-C. G. Mouriquand, V. Edel, and M. Dauvergne (Compt. rend. Soc. Biol., 1939, **130**, 667—669).—Sub-acute avitaminosis-C, characterised by slow development, hæmorrhagic symptoms, and resistance of the digestive disorders to healing, can be induced in guinea-pigs by the addition of small quantities of ascorbic acid to a scorbutic diet. H. G. R.

Thrombocyte count and vitamin-C. G. Papayanopulos and H. Schroeder (Klin. Woch., 1939, **18**, 428—429).—Injection of 400—7000 mg. of l-ascorbic acid raised the thrombocyte count in a no. of cases. E. M. J.

Action of vitamin-C on reactionary hyperæmia during healing of fractures. E. W. Lexer (Klin. Woch., 1939, **18**, 208—209).—Fracture hyperæmia was deficient in scorbutic guinea-pigs; tearing of small vessels was shown by X-rays after the 15th day. E. M. J.

Blood studies of vitamin-C during pregnancy, birth, and early infancy. C. E. Snelling and S. H. Jackson (J. Pediat., 1939, **14**, 447—451).—In pregnant women there is a fall in plasma-ascorbic acid towards the end of pregnancy. The fœtus has higher vals. than the maternal blood taken ante-partum. Totally breast-fed babies are well supplied with -C if the ascorbic acid of the milk is greater than 4 mg.-%; if the ascorbic acid in the breast milk is below 2 mg.-%, there is likelihood of a deficiency in the baby. In artificially fed babies not receiving additional -C, the level of ascorbic acid in the blood is low. C. J. C. B.

Administration of vitamin-C during menstrual cycle. H. Winkler and W. Seebach (Mschr. Geburtsh. Gynäk., 1938, **108**, 67—82).—The urinary vitamin-C excretion of 12 normal subjects fluctuated between 18 and 47 mg. per day. 300 mg. of ascorbic acid were given by mouth for 5 days; 60—85% was excreted after 5 days. There is no relationship between urinary -C excretion and the menstrual cycle. Leucopenia, eosinophilia, and lymphocytosis were observed after administration of -C. S. Sch.

Vitamin-C content of placenta. W. Neuweiler Z. Geburtsh. Gynäk., 1938, **118**, 27—38).—The largest concn. of vitamin-C was found in the syncytial part of the placenta; -C was also found in the stroma and decidua. The placental concn. of -C depends on the ascorbic acid content of maternal blood. S. Sch.

Vitamin-C content of the human brain. F. Diehl and H. Neumann (Klin. Woch., 1939, **18**, 418—422).—Great variations occurred in the vitamin-C content of various parts of 20 brains. The tuber cinereum, medulla oblongata, and pituitary have the highest, cerebrum and corpus callosum the lowest, content. E. M. J.

Excretion of vitamin-C in sweat. I. S. Wright and E. MacLenathen (J. Lab. clin. Med., 1939, **24**, 804—805).—Samples of perspiration contained 0·024—0·186 mg.-% of vitamin-C. These vals. were not changed by intravenous injection of large amounts of -C (1 g. of cebione). The loss of -C during periods

of excessive sweating is best explained by increased body metabolism and the subsequent increased utilisation of ascorbic acid in the tissues. C. J. C. B.

Breed and seasonal variations in ascorbic acid contents of certified milk from Guernsey and Holstein cows. A. D. Holmes, F. Tripp, E. A. Woelffer, and G. H. Satterfield (J. Nutrition, 1939, **17**, 187—198).—The ascorbic acid contents of the milk showed seasonal variations with peak vals. in Feb. and in late Oct.—Nov. Vals. for Guernsey milk (17·7—23·4) were consistently above those for Holstein milk (15·7—20·4 mg. per l.). Variations in ascorbic acid content of raw certified milk produced under commercial conditions are independent of the ration and period of lactation. A. G. P.

Action of ultra-violet radiation on vitamin-*C* content of milk. K. Scheer (Münch. med. Wschr., 1939, **86**, 603—604).—The changes in vitamin-*C* content of milk produced by ultra-violet radiation are insignificant. A. S.

Ascorbic acid in metabolism of apple fruit. S. S. Zilva, F. Kidd, and C. West (New Phytol., 1938, **37**, 345—357).—Both *l*-ascorbic and dehydro-ascorbic acids occur in the fruit. The total vitamin-*C* content (in both forms) per unit wt. of fresh tissue is const. throughout the growth of the apple. With approaching maturity the proportion of *l*-ascorbic acid increases. Oxidation of ascorbic acid is probably effected by a polyphenolase and is related to metabolic processes in the growing fruit. (Cf. A., 1937, III, 79.) A. G. P.

Potassium cyanide as an agent inhibiting the oxidation of vitamin-*C* *in vitro*. I. S. Wright and E. MacLenathen (J. Lab. clin. Med., 1939, **24**, 808).—Addition of KCN retards slightly, but does not prevent, the oxidation of ascorbic acid in blood specimens. The apparent protection against oxidation processes is so unpredictable as to be of no practical val. C. J. C. B.

Determination of saturation by vitamin-*C*. A. Góth (Nature, 1939, **143**, 557—558).—Saturation is indicated when the vitamin-*C* concn. of blood is doubled 2 hr. after injection of 300 mg. into blood originally containing less than 1 mg.-%. In hypovitaminosis, the amount of -*C* finally found is the same as or only slightly greater than that originally present. L. S. T.

Intradermal test for vitamin-*C* determination. I. S. Wright and E. MacLenathen (J. Lab. clin. Med., 1939, **24**, 806—807).—The intradermal injection of 2 : 6-dichlorphenol-indophenol is not a reliable guide to vitamin-*C* in the body, as the variations in the decoloration time were too great to set up a normal range; readings taken at one site varied considerably from those at a near or distant site. In 2 cases of marked -*C* deficiency the time fell below the normal set of Rotter while many normals were above his normal range. C. J. C. B.

Keratinous degeneration of the coccygeal gland of *Gallus domesticus* in relation to rickets. G. Ferriani (Boll. Soc. ital. Biol. sperim., 1939, **14**, 122—123).—The degenerative changes in the gland accompanying the incidence of rickets in fowls are described. F. O. H.

Production of rickets in rats on diets containing oxalate. W. H. Adolph (Chinese J. Physiol., 1939, **14**, 51—54).—The bones of rats were more rachitic as estimated by ashing and the line test, when about $\frac{2}{3}$ of the phosphate of a diet with Ca : P ratio 1 : 6 was replaced by oxalate. N. H.

Carbon dioxide output in non-anæsthetised and anæsthetised rats with rickets. R. Nicolaysen (Skand. Arch. Physiol., 1939, **82**, 79—85).—Rickets was produced in rats with the Steenbock–Black diet no. 2965; the animals were subsequently cured with vitamin-*D*. The CO_2 output of the diseased non-anæsthetised rats was lower than that of the cured animals. The CO_2 output was identical in both conditions in rats anæsthetised with pernocton. A. S.

Treatment of rickets and tetany with a single massive dose of vitamin-*D*. H. Vollmer (J. Pediat., 1939, **14**, 491—501).—Rickets and tetany can be cured by the peroral administration of a single dose of 600,000 I.U. of vitamin-*D*; the effect is more prompt than with daily small doses. Serum-Ca and -P become normal and there is roentgenographic evidence of calcification within a week. Tetanic convulsions did not recur after treatment and hyperirritability disappeared in 2 days after treatment. Hypernormal vals. of serum-P may occur but return to normal within 2—4 weeks. There are no contra-indications to this type, which can be used for neonatal and infantile tetany, severe rickets, rickets associated with pneumonia or pertussis, or chronic infections. C. J. C. B.

Effects of calciferol in the thyroparathyroidectomised–nephrectomised rat. W. R. Tweedy, R. D. Templeton, M. C. Patras, F. A. McJunkin, and E. W. McNamara (J. Biol. Chem., 1939, **128**, 407—415).—Large doses of calciferol do not produce hypercalcæmia unless the Ca : P ratio of the blood is normal. E. M. W.

Biological vitamin-*D* assay of low-potency materials with reference to the rôle of the mineral content of the diet. N. T. Gridgeman, H. Lees, and H. Wilkinson (Biochem. J., 1939, **33**, 645—654).—The presence of excess of fat in the diet of rats affects the calcification produced by vitamin-*D* only indirectly, *i.e.*, by lowering salt consumption. Hence the salt intake must be standardised in testing low-grade oils, and the healing power of -*D* varies inversely as such intake. Some healing occurs on a low salt intake even in the absence of -*D*. P. G. M.

Fat-soluble vitamins. III. Sterols (steroids), vitamin-*D*, -*E*, -*F*, and -*K*. W. Halden (Fette u. Seifen, 1939, **46**, 217—224; cf., A., 1938, II, 503; 1937, III, 187).—A review. E. L.

Furfuraldehyde [colour] reactions of vitamin-D_2, hormones of the adrenal cortex, the corpus luteum, and the androsterone and testosterone groups, and their relationships to constitutive factors.—See A., 1939, II, 327.

Action of vitamin-*E* on relationship between ovaries and thyroid gland. E. SCHNEIDER (Med. Klin., 1939, **35**, 499—501).—A lecture. A. S.

Constitution of vitamin-*E*. K. A. JENSEN (Dansk Tidsskr. Farm., 1939, **13**, 125—138).—A review. M. H. M. A.

Synthesis of lower homologues of α-tocopherol. —See A., 1939, II, 274.

Growth and reproduction on a low-fat diet. C. G. MACKENZIE, J. B. MACKENZIE, and E. V. MCCOLLUM (Biochem. J., 1939, **33**, 935—943).—The prep. of a diet with a total lipin content of approx. 0·27% is described. The max. non-vitamin lipin content is 0·0156% with, and 0·0056% without, added vitamin-*E* concentrate. There is no evidence for the existence of an unknown fat-sol. factor required for growth and reproduction in the rat, since the inferiority of young born to females on such a diet is probably primarily due to inadequate milk production. The first symptoms of paralysis on the -*E*-deficient low-fat diet develop at 40—42 weeks. P. G. M.

Avitaminosis-*K* produced in mice by dietary means. R. MURPHY (Science, 1939, **89**, 203—204).—Bleeding time was reduced in mice by the addition of an ether extract of lucerne to a diet low in vitamin-*K*. W. F. F.

(xix) METABOLISM, GENERAL AND SPECIAL.

Technical, mechanical, and interpretative aspects of basal metabolism. J. K. LEX and G. M. PARKER (Amer. J. clin. Path., Tech. Suppl., 1939, **3**, 91—118).—A review of technical details with numerous illustrative charts. C. J. C. B.

Nervous and hormonal control of basal metabolic rate. W. WINKLER (Wien. Arch. inn. Med. 1938, **32**, 241—260).—Cases are recorded with a basal metabolic rate of +20—50 without loss of wt. Only a few cases of obesity had a diminished basal metabolic rate. A. S.

Effects of diphtheria on metabolism. J. DIECKHOFF (Z. ges. exp. Med., 1939, **105**, 640—656).—The basal metabolic rate of rabbits poisoned with diphtheria toxin is decreased; this is prevented by ascorbic acid, adrenal cortex hormone, or thyrotropic hormone. Slices of spleen, liver, adrenal cortex, and other organs show a decreased O_2 consumption in the later stages of the intoxication. *In vitro*, addition of diphtheria toxin has no action on tissue respiration. Respiration, in poisoned animals, of spleen, liver, and adrenal cortex is increased, that of heart, brain, and kidney is diminished if ascorbic acid and adrenal cortex hormone are administered; thyrotropic hormone increases O_2 consumption of spleen and renal cortex. A. S.

Protein metabolism in diphtheria intoxication. J. DIECKHOFF (Z. ges. exp. Med., 1939, **105**, 621—639).—Non-protein-N in serum is increased after injection of diphtheria toxin; this phenomenon is not changed by administration of ascorbic acid or adrenal cortex hormone and intravenous NaCl injection. Ascorbic acid and adrenal cortex hormone prevent the increase in non-protein-N in rabbits poisoned with diphtheria toxin, if the substances were given up to 12 hr. after the administration of the toxin. A. S.

Protein metabolism. IX. Utilisation of ammonia by normal rats on a stock diet. D. RITTENBERG, R. SCHOENHEIMER, and A. S. KESTON (J. Biol. Chem., 1939, **128**, 603—607).—Adult rats were fed on a diet containing 15% of caseinogen and isotope-"labelled" NH_4 citrate the N content of which corresponded with 5·8% of the total dietary N. The proteins separated from liver, intestinal tract, kidney, and muscle contained significant amounts of radioactive N. Arginine, glycine, and glutamic acid isolated from the liver and intestinal proteins and arginine from the kidney-protein were radioactive, the activity being highest in the liver fractions. Hæmin from the erythrocytes and creatine from the muscles showed an isotopic val. slightly above normal. A. L.

Specific dynamic action of protein. W. LINNEWEH (Z. ges. exp. Med., 1939, **105**, 345—362).—There are no rhythmical changes in the sp. dynamic action of protein within 24 hr.; it is independent of rhythmical variations of the basal metabolic rate and is not influenced by previous administration of atropine or ergotamine. The dynamic action of the same amount of protein is always const. in the same subject but shows individual variations. A. S.

Effect of calcium on tissue respiration. Determination of oxalacetic acid. G. D. GREVILLE (Biochem. J., 1939, **33**, 718—722).—The production of oxalacetate from fumarate and the disappearance of oxalacetate in suspensions of minced pigeon breast muscle are inhibited in the presence of 0·0021M-$Ca^{\cdot\cdot}$ + 0·0031M-$K^{\cdot}$ and accumulation of succinic acid is inhibited in that of 0·0018M-$Ca^{\cdot\cdot}$ + 0·0028M-$K^{\cdot}$. Hence the inhibitory effect of $Ca^{\cdot\cdot}$ on the respiration of the minced muscle is not due to sp. action on one enzymic reaction. Oxalacetic acid is manometrically determined at 5° by Edson's method (A., 1935, 1273) or by a modification of Ostern's method (A., 1933, 964) in which abs. alcohol is used to increase the amount of dissolved aniline. Acetoacetic acid does not interfere in Edson's method. W. McC.

Influence of amino-acids on tissue respiration *in vitro*. H. YAMAMOTO (Tohoku J. exp. Med., 1938, **34**, 189—213).—The tissue respiration of kidney cortex of rabbits was studied by Warburg's second method. Tyrosine, tryptophan, and especially cystine increased respiration compared with that in Ringer's solution. Glycine and alanine had no influence. Numerous detailed tables are given. F. JA.

Continuous deamination and reamination of amino-acids in the proteins of normal animals. R. SCHOENHEIMER, S. RATNER, and D. RITTENBERG (Science, 1939, **89**, 272—273; cf. A., 1939, III, 405).—The occurrence of extensive deamination and reamination of NH_2-acids of the proteins in normal animals has been demonstrated by following the fate of *l*-leucine, containing D in the C-chain and ^{15}N in the NH_2-group, in adult rats. L. S. T.

[**Oxidative deamination of arginine by skin of rat.**] B. BORGHI (Klin. Woch., 1939, **18**, 507—508). E. M. J.

Comparison of metabolic pathways of glycine and alanine. C. Reid (Biochem. J., 1939, **33**, 723—725).—Alanine readily increases the store of glycogen in the liver, whether absorbed through the intestinal tract or the peritoneum of the rat, whilst glycine does not. The increase in the excretion of inorg. S produced by both these acids occurs as a result of increased protein catabolism, presumably associated with their sp. dynamic action which, however, does not explain the differences occurring in glycogen storage. It is suggested that alanine, but not glycine, forms carbohydrate. P. G. M.

Metabolism of cystine and methionine. U. Hecht (Dtsch. Z. VerdauKr. Stoffw., 1939, **1**, 289—296).—A review. E. M. J.

Production of taurocholic acid in the dog. IV. Cysteine, homocysteine, and thioglycollic acid. R. W. Virtue and M. E. Doster-Virtue (J. Biol. Chem., 1939, **128**, 665—672; cf. A., 1937, III, 382).—The livers of fasting dogs with biliary fistulæ are depleted of taurine by feeding cholic acid, and cysteine or homocysteine is injected intravenously while cholic acid is fed. In both cases the excretion of taurocholic acid is increased. Thioglycollic acid injected subcutaneously did not affect the taurocholic acid output. The greater part of the extra S recovered in the urine after injection of the three substances is oxidised to SO_4''. A. L.

Metabolism of sulphur. VII. Quantitative study of replaceability of *l*-cystine by sulphur-containing amino-acids in the diet of albino rats. M. A. Bennett (Biochem. J., 1939, **33**, 885—892).—One mol. of *l*-cystine is equiv. to 3 mols. of *l*-cystine disulphoxide, 2 mols. of *l*-cysteine, or 2 mols. of *l*-methionine. *l*-Methionine increases utilisation of food for growth, but the *dl*-form is less effective. P. G. M.

Mechanism of creatine formation. II. Production of creatine from guanido-compounds. Significance of guanidomalonic acid. S. I. Shibuya (J. Biochem. Japan, 1939, **29**, 339—360; cf. A., 1938, III, 47).—*In-vitro* experiments with liver (rabbit) slices failed to indicate the direct conversion of arginine into creatine. Creatine formation from *guanidomalonic* (from bromomalonic acid and guanidine; carbonises on heating) and -glutaric acid did not occur; urea and guanidine were also ineffective. F. O. H.

Mechanism of biological synthesis of acetylcholine. II. Edgar Stedman and Ellen Stedman (Biochem. J., 1939, **33**, 811—821; cf. A., 1938, III, 148).—Treatment of minced ox brain with $CHCl_3$–eserine at room temp. or at 37° gives rise to increased acetylcholine production. Ether resembles $CHCl_3$ in its action but does not inactivate the mechanism responsible for acetylcholine formation even at 37° and therefore gives higher vals. at this temp. Acetylcholine of ox brain is increased from 1·5 to 17 μg. per g., and that of rat brain from 0·6 to 16 μg. per g. Na acetoacetate increases the yield of acetylcholine and is considered to be a precursor, whilst glucose has no effect. P. G. M.

Action of calcium on purine metabolism. F. Chrometzka and H. E. Voigt (Klin. Woch., 1939, **18**, 532—535).—Intravenous injection and, to a smaller degree, oral administration of Ca preps. lower uric acid excretion in man on a purine-free diet. The rise in uric acid excretion after administration of nucleic acid is also checked. E. M. J.

Radioactive phosphorus as an indicator of phospholipin metabolism. VI. Phospholipin metabolism of neoplastic tissues. H. B. Jones, I. L. Chaikoff, and J. H. Lawrence (J. Biol. Chem., 1939, **128**, 631—644; cf. A., 1939, III, 297).—Using radioactive PO_4''', the phospholipin metabolism in mammary carcinoma, lymphoma, lymphosarcoma, and sarcoma tumours implanted in mice was studied. No uniformity in the phospholipin activity of the four types of tumours was observed, the differences between tumour types being as great as those found among normal tissues. Cell type did not determine the phospholipin activity, similar activities being found in mammary carcinoma and lymphosarcoma. Although the activity in the tumours was not as great as that in the liver, there was a closer resemblance to the more active (liver, kidney) than to the less active tissues (muscle, brain). The phospholipin content of the liver is diminished when large tumours are present. A. L.

Unstable isotopes. II. Relative speed of formation of lecithin and kephalin in the body. E. Chargaff (J. Biol. Chem., 1939, **128**, 587—595).—By feeding Na_2HPO_4 containing radioactive P to rats, the relative speed of formation of lecithin and kephalin is followed. Total lecithin and kephalin in the body are synthesised at about the same speed, but in the intestinal tract and liver, the amount of newly formed kephalin exceeds that of lecithin. A. L.

Metabolsim of steroids. I. 7-Hydroxycholesterol and "hepatols" from ox liver. G. A. D. Haslewood (Biochem. J., 1939, **33**, 709—712).—The isolation of α-7-hydroxycholesterol as dibenzoate and of 2 partly purified, digitonin-precipitable alcohols (probably C_{21}), m.p. approx. 285° and 265°, respectively, from the unsaponifiable matter of ox-liver residue (after extraction with 50% alcohol) is described. W. McC.

Fatty acid oxidation in liver. L. F. Leloir and J. M. Muñoz (Biochem. J., 1939, **33**, 734—746).—The micro-determination of fatty acids is described. The rates of disappearance of different acids by the action of liver slices are: formic, 1·5; acetic, 5; propionic, 2; butyric, 9; valeric, 2; hexoic, 6; heptoic 3; octoic, 6. Butyric, hexoic, and heptoic acids undergo β-oxidation almost exclusively. Not more than 20% of the acetic acid oxidised can be accounted for as ketonic acids, nor are glycollic and oxalic acids formed. C_4 dicarboxylic acids inhibit ketonic acid formation and increase the reduction of acetoacetic acid. P. G. M.

Deposition and utilisation of fatty acids. I. Fat synthesis from high-carbohydrate and high-protein diets in fasted rats. H. E. Longenecker (J. Biol. Chem., 1939, **128**, 645—658).—The mol.

distribution of fatty acids in the neutral fats of rats under various conditions of dieting was determined. Rats fed on a diet containing 5% of fat stored fat in which oleic, palmitic, and linoleic acids predominated. Rats, which by fasting had their fat reserves reduced to 1·1% and were then fed on high-carbohydrate and high-protein diets, deposited fat to the extent of 35·1 and 36·1%, respectively, of the total wt. regained, *i.e.*, 20—30 times the amount of fat consumed during the feeding period. This "synthetic" fat contained 40—45% of C_{16} acids of which 13—15% was hexadecenoic acid, whilst only 25—30% of C_{16} acids was present in control rats fed on a basal, 5% fat diet. Similar results were obtained with rats raised on a high-carbohydrate diet from weaning. When depot fats were utilised by fasting animals, only slight changes in the nature of the fatty acids of the remaining fat occurred. In rats, there is a tendency to restrict the saturated acids to 35—37% of the total. A. L.

Biochemical significance of unsaturated fatty acids. S. Skraup, F. Strieck, and J. Schorn (Z. physiol. Chem., 1939, **259**, 1—18).—Partly a review. Determination of the R.Q. of dogs and feeding experiments with rats show that saturated fatty acids with odd no. of C are metabolised only slowly, and those with even no. of C are not metabolised properly unless unsaturated acids are present. The latter accelerate the oxidation and breakdown of the saturated acids, and they also have an accelerating effect on oxidation of carbohydrates. This effect of unsaturated acids is not catalytic, for over 10%, and preferably 25—33%, is needed in the diet. It is suggested that they function as H acceptors and so hasten the oxidation of the saturated acids. The effect depends partly on constitution for although heptadecenoic-8 acid, oleic acid, and the "oleic" form of nonadecenoic-10 acid have almost the same effect although the double linking is in a different position in each acid, yet elaidic acid and the "elaidic" form of the above nonadecenoic acid are quite inactive. Linoleic acid can be reduced quantitatively to oleic acid, but not to stearic acid, by heating in alkaline solution with *p*-thiocresol. J. N. A.

Serum-cholesterol and fat content of tissues in Aujeszky's disease. D. Ionnesco and I. Zugravesco (Compt. rend. Soc. Biol., 1939, **130**, 581—583).—The serum-cholesterol is raised from 49 to 74 mg.-% in rabbits suffering from Aujeszky's disease. The total lipin content of the heart and liver is also raised, from 21 to 24 g.-% and from 15 to 22 g.-% respectively. The lipin content of the brain is reduced from 48 to 45 g.-%. P. C. W.

Carbohydrate and fat metabolism in adult lepidoptera. I. W. Kozhantshikov (Bull. Entom. Res., 1938, **29**, 103—114).—Sugar consumption by females of *Agrotis segetum*, *Pyrausta nubilalis*, and *Loxostege sticticalis* is max. during the first 4—5 days after emergence. During gonad maturation O_2 consumption and body-wt. increase; during oviposition O_2 consumption further increases, sugar consumption remains steady, and body-wt. declines. Sugar is digested when given in 5—40% solutions and is partly utilised in synthesis of fat for egg-yolk production. Starvation of moths leads to nearly complete disappearance of fat and production of fewer eggs which may be sterile or incompletely developed. The R.Q. of moths immediately after feeding is high (1·5—1·6) due to increased CO_2 production but subsequently (8—10 hr.) is irregular and frequently low (0·5—0·6). A metabolic phase in R.Q. occurs soon after feeding and is due to fat synthesis involving diminished O_2 consumption. A. G. P.

Physiology and pathology of intermediate fat metabolism. VII. Hyperlipæmia and diabetes. G. Katsch and H. G. Krainick (Klin. Woch., 1939, **18**, 436—441).—Two forms of diabetic hyperlipæmia are described, one reversible, and the other irreversible, and const. for the individual. E. M. J.

Diabetes, insulin action, and the respiratory quotient. E. M. Bridge and E. A. Winter (Johns Hopkins Hosp. Bull., 1939, **64**, 257—272).—No direct relationship was observed in diabetic patients between insulin action and R.Q. Hypoglycæmia from overdosage with insulin is due not to an abnormal rate of carbohydrate combustion, but to an excessive deposition of glucose as glycogen in the muscles. Criteria suggested for the regulation of diabetics are ketosis, R.Q. level, conditions affecting efficiency of insulin action, and blood-sugar fluctuations. T. F. D.

[Action of vitamins in sugar tolerance in pituitary cachexia.] F. Diehl and L. Kirchmann (Klin. Woch., 1939, **18**, 422—423).—In a case of pituitary cachexia the ingestion of glucose led to a terminal hypoglycæmic phase. After 3 weeks' oral administration of vitamin-*C* and -*B* the tolerance curve became normal. E. M. J.

Effect of phloridzin on carbohydrate metabolism *in vitro*. S. J. Bach (Biochem. J., 1939, **33**, 802—810).—Evidence of inhibition of carbohydrate oxidation *in vitro* by phloridzin (increased carbohydrate synthesis and reduction of R.Q.) is discussed. This effect appears to be due to the complete glucoside since, in the absence of added glucose, phloretin in concns. above 0·001M. partly inhibits O_2 uptake and carbohydrate synthesis in liver slices. P. G. M.

Utilisation and digestion of carbohydrates in mulberry leaves by silkworms. VII. Changes in respiration of silkworms bred on mulberry leaves to which sucrose is added in varying amounts. VIII. Changes in metabolism when bred on leaves and sucrose and fate of the digested sucrose. IX. Digestion of carbohydrates in leaves of different kinds of mulberry trees. K. Kato (J. Agric. Chem. Soc. Japan, 1939, **15**, 385—393; cf. A., 1939, III, 233).—VII. Respiration is increased by addition of moderate amounts of sucrose, but decreased when an excess is added.

VIII. Total digestion and digestion of protein and carbohydrate per 10 hr. are increased. The amounts of protein, glycogen, and fat in the body are increased. The consumption of protein is decreased whilst that of carbohydrate is increased. 8·51% of the digested carbohydrate is converted into glycogen,

40·15% into fat, and 51·68% is oxidised to CO_2 and water.

IX. Digestion and digestibility of carbohydrate, sucrose, and reducing sugars are directly related to the sugar content. J. N. A.

Sugar alcohols. XX. Fate of *d*-sorbitol, styracitol, and *l*-sorbose in the animal body. C. J. Carr and S. E. Forman (J. Biol. Chem., 1939, **128**, 425—430; cf. A., 1938, III, 827).—*d*-Sorbitol, styracitol, or *l*-sorbose added to a basal fat diet is stored as glycogen in the liver (rat). Styracitol is not directly metabolised since, on gastric administration, it does not raise the R.Q. of fasting rats or the blood-sugar of fasting rabbits. E. M. W.

Absence of a significant glucose–lactic acid cycle (involving the liver) in normal unanæsthetised dogs. I. S. Cherry and L. A. Crandall, jun. (Amer. J. Physiol., 1939, **125**, 41—47).—The amounts of glucose and lactic acid added to or withdrawn from the blood passing through the gastrointestinal tract, liver, and leg tissue in fasting, unanæsthetised dogs were determined by analyses of the blood entering and leaving these organs. Average retention (per 100 c.c. of blood) of glucose by leg tissue was 4·8±0·74 mg.; output of lactic acid was 3·1±0·40 mg. Output of glucose by the liver was 9·1±0·68 mg., average retention of lactic acid was 0·28 mg. The gastrointestinal tract removed 2·9± 0·33 mg. of glucose; no significant addition of lactic acid was shown. M. W. G.

Ketosis and acidosis in diabetic coma. R. Schneider and H. Droller (Quart. J. Exp. Physiol., 1938, **28**, 323—333).—Acetoacetic acid and its Na salt administered by continuous intraveneous infusion to rabbits produced a state resembling diabetic coma with normal or relatively high alkali reserve. β-Hydroxybutyric acid did not produce coma even at low alkali reserve. HCl produced coma only at a low alkali reserve. It is concluded that diabetic coma is due to a sp. intoxication by the acetoacetic anion. T. S. G. J.

Antiketogenic activity of succinic acid. E. M. MacKay, J. W. Sherrill, and R. H. Barnes (J. clin. Invest., 1939, **18**, 301—305).—Succinic acid has no antiketogenic activity in human diabetes. In a normal fasting person, it is as antiketogenic as an equiv. amount of glucose, to which succinic acid is converted in the phloridzinised, and probably also in the normal, organism. The ketosis of fasting rats which had previously received a diet producing a fatty liver is reduced to the same degree by glucose or an equiv. amount of succinic acid. C. J. C. B.

Formation and use of ketones in the organism. S. Markees (Schweiz. med. Wschr., 1939, **69**, 405—407).—A review. A. S.

Pyruvate oxidation in brain. V. Evidence derived from metabolism of α-ketobutyric acid. C. Long and R. A. Peters (Biochem. J., 1939, **33**, 759—773).—α-Keto-valeric and -butyric acids and pyruvic acid require cocarboxylase for their decarboxylation by yeast and, in presence of cocarboxylase, aneurin enhances the effect. α-Ketovaleric acid is less reactive than the other two acids with the pyruvate dehydrogenase system in the presence of methylene-blue, and it is only very slightly oxidised by washed brain tissue. The pyruvate oxidation system is moderately resistant to freezing. The main difference between yeast and brain decarboxylase systems is that in the latter oxidation also occurs. The protein portion of the dehydrogenase appears to be different in yeast and brain. P. G. M.

Phosphoric esters formed in kidney extracts. H. Kalckar (Biochem. J., 1939, **33**, 631—641; cf. A., 1939, III, 275).—Adenylic acid, carbohydrates, glycerol, and pyruvic acid act as P acceptors in the presence of aq. extracts of rabbit or cat kidney cortex. Glycerol is phosphorylated to *l*-α-glycerophosphate, glucose and fructose to fructose diphosphate and dihydroxyacetone phosphate, and adenylic acid to adenyl pyrophosphate. Phosphopyruvic acid is also formed in the presence of malic or fumaric acid, although the P acceptor proper formed by oxidation of these acids may not be pyruvic acid. P. G. M.

Effect of vitamin-B_1 on glycolysis of liver cells. F. Steigerwaldt (Klin. Woch., 1939, **18**, 431—434).—Addition of vitamin-B_1 increases aërobic glycolysis of liver cells more than anaërobic, in mice, rats, and rabbits; it has no influence on muscle slices. -B_1 as a phosphoric acid ester may transform pyruvic into lactic acid. E. M. J.

Ammonia content of canine blood after oral administration of ammonium salts and ammonia. H. Koprowski and H. Uniński (Biochem. J., 1939, **33**, 747—753).—The normal resting blood-NH_3 content is nil. Oral administration of NH_4Cl (0·5 g. per kg.) gives rise to a mean val. for blood-NH_3 of 1·0 mg. per 100 c.c. after 15 min.; this returns to normal after 1½ hr. Blood-urea increases at the same time by 2—36 mg. per 100 c.c. Administration of aq. NH_3 produces only a moderate rise in blood-NH_3. P. G. M.

Sodium and chloride metabolism in diphtheria intoxication. J. Dieckhoff (Z. ges. exp. Med., 1939, **105**, 607—621).—Serum- and urine-Na and -Cl of rabbits are decreased 3—4 days after injection of diphtheria toxia; Na and Cl accumulate in the damaged tissues. Intravenous injection of adrenal cortex hormone and ascorbic acid prevents these changes if performed up to 12 hr. after the intoxication. Na and Cl are diminished in serum and urine of human diphtherics; administration of ascorbic acid and adrenal cortex hormone has no influence on these changes. A. S.

Metabolism of dogs treated with fluorescein and 2 : 4-dinitrophenol. R. H. de Meio (Anal. Assoc. Quím. Argentina, 1938, **26**, 254—262).—By determination of R.Q. it is found that increase of metabolism of fasting dogs, injected with fluorescein, due to endovenous injection with 2 : 4-dinitrophenol, occurs principally at the expense of the fats, and also of carbohydrates if present. Ketones were formed even in presence of dinitrophenol. There was no extra metabolism of proteins. F. R. G.

Rôle of the aromatic amino-group in deranged pigment metabolism. G. Brownlee (Biochem. J., 1939, **33**, 697—708).—In rats, oral administration

of acetanilide, phenacetin, phenazone, pyramidone, aspirin, and *p*-aminophenol, in daily doses of 25% of the average lethal dose, causes loss of wt., progressive anæmia, slight photo-sensitisation, enlargement and blackening of the spleen (with deposition of Fe in the sinuses and of brown non-staining pigment in the pulp), abnormal excretion of urobilin, and porphyrinuria, the extent of which is approx. parallel to the acute toxicities of the compounds. Equiv. doses of phenacetin and phenazone cause the same degree of porphyrinuria, the effects of pyramidone and aspirin being twice, and that of acetanilide 4 times, as great whilst the effect of *p*-aminophenol is greater than that of acetanilide. The porphyrin excreted in the urine is coproporphyrin-III together with smaller amounts of -I. *p*-Aminophenol is probably the common active biological degradation product of aromatic compounds containing the phenylamine residue and quinol the degradation product of those which contain no amino-group, redox systems produced by *p*-aminophenol and quinol being responsible for the oxidation of hæmoglobin to methæmoglobin. When this oxidation occurs, coproporphyrin-III is produced instead of bilirubin. W. McC.

(xx) PHARMACOLOGY AND TOXICOLOGY.

Sulphanilamide and its derivatives in treatment of experimental pneumococcus infections. J. A. Kolmer, G. W. Raiziss, and A. M. Rule (J. Lab. clin. Med., 1939, **24**, 779—795).—Sulphanilamide was only slightly effective in the treatment of type 1 pneumococcus peritonitis and septicæmia of rats or intradermal infections or septicæmia of rabbits. Better results were obtained in similar type 2 or 3 infections. The acetyl derivative of sulphanilamide was less effective than sulphanilamide in intradermal infection or septicæmia of rabbits with types 1, 2, and 3. 4 : 4′-Diaminodiphenyl sulphone was more effective in rabbits than sulphanilamide in the treatment of infections with types 1 and 2 pneumococci but less effective in the case of type 3. The diacetyl derivative of 4 : 4′-diaminodiphenyl sulphone was less effective than sulphanilamide or diaminodiphenyl sulphone in the treatment of type 1 and 2 infections in rabbits but equal to them in the treatment of type 3 infections. C. J. C. B.

Treatment of influenza with sulphonamide. B. Woylas (Wien. med. Wschr., 1939, **89**, 503—504).—Sulphanilamide is recommended in treatment and prophylaxis of influenza. Sinusitis and pneumonia are prevented. A. S.

Combined prontosil-pyramidon treatment. E. W. Müller (Med. Klin., 1939, **35**, 604—606).—0·3 g. of prontosil and 0·1 g. of pyramidon 3 times daily are recommended for treatment of streptococcal and staphylococcal diseases with high fever. A. S.

Specificity of prontosil in erysipelas. W. König (Dtsch. med. Wschr., 1939, **65**, 601).—32 patients, suffering from erysipelas, were treated with prontosil. The therapeutic result was not different from that obtained in 31 patients treated with ichthyol ointment alone. A. S.

Chemotherapy of erysipelas. K. Bockhorn (Wien. med. Wschr., 1939, **89**, 582—585).—Details of erysipelas treatment with prontosil are given. A. S.

Hæmolytic streptococcus (beta) septicæmia following a burn ; pooled human convalescent scarlet fever serum therapy. N. Hiatt and S. L. Goldberg (Arch. Pediat., 1939, **56**, 176—181).—The disease did not respond to sulphanilamide therapy but did to human convalescent scarlet fever serum. C. J. C. B.

Effect of sulphanilamide on *Brucella abortus* infection in two cows. E. E. Hamann and I. F. Huddleson (J. Amer. Vet. Med. Assoc., 1939, **47**, 35—37).—80 g. of sulphanilamide were given daily *per os* to a cow (body-wt. 360 kg.) with *B. abortus* infection. This dose approached the limit of tolerance. No definite conclusions were reached. E. G. W.

Products of ultra-violet irradiation of sulphanilamide. C. L. Fox, jun., J. E. Cline, and R. Ottenberg (J. Pharm. Exp. Ther., 1939, **66**, 99—106).—Investigation of the direct effect of the blue product, formed on irradiation of sulphanilamide, failed, owing to its instability. O_2 was essential for its formation. *In vivo* it may aid bacteriostasis by acting as part of a reversible oxidation–reduction system. E. M. S.

Sulphanilamide concentration and distribution in blood and urine in sulphanilamide therapy for gonococcic infections in men. L. Hansen (J. Pharm. Exp. Ther., 1939, **65**, 372—382).—The concn. of sulphanilamide (free, combined, and total) is greater in corpuscles than in plasma. 75% of the total blood content is in the form of free sulphanilamide. In the urine the combined form is in excess of the unchanged. No correlation exists between the response to treatment and the concn. and distribution of the drug in whole blood and urine. Failure of treatment is associated with a high corpuscles/plasma ratio for combined sulphanilamide. E. M. S.

Diffusion and distribution of sulphanilamide in the organism. L. Liaci (Arch. Farm. sperim., 1939, **67**, 146—158).—Data for the distribution of the drug in the organs of rabbits 24 hr. after administration are tabulated; the greatest concn. occurred in the kidney. F. O. H.

Acetylation of sulphanilamide. J. D. Stewart, M. Rourke, and J. G. Allen (Surgery, 1939, **5**, 232—236).—The liver is the site of acetylation of sulphanilamide in the rabbit. Acetylation progresses until the free form is present in minimal quantities in the bilaterally nephrectomised rabbit. G. K. H.

Pharmacological and toxicological properties of sulphanilamide and benzylsulphanilamide. H. Molitor and H. Robinson (J. Pharm. Exp. Ther., 1939, **65**, 405—423).—The acute, cumulative and chronic toxicity of benzylsulphanilamide, determined on mice, rats, rabbits, and dogs, was less than that of sulphanilamide. Nervous symptoms, decreased urinary output during water diuresis, and post-mortem changes produced by sulphanilamide were not found with benzylsulphanilamide. Sulph-

anilamide was liberated in the blood, after administration of benzylsulphanilamide, in concns. which may account for its therapeutic effects. E. M. S.

Substituted sulphanilamides. Acyl derivatives.—See A., 1939, II, 308.

Action of artificial pyrexia on uleron-fed pigeons. K. H. Schölzke (Dtsch. med. Wschr., 1939, **65**, 799—800).—Neuritic symptoms were not observed in 13 uleron-fed pigeons in which artificial pyrexia was produced by various types of radiation. A. S.

Treatment of pneumonia with eubasin. C. Hegler (Med. Welt, 1939, **13**, 731—733).—Eubasin (= M. & B. 693) was used in 90 patients suffering from lobar pneumonia. 44 patients had a normal temp. within 24 hr. after onset of treatment. The mortality rate was 4·4%, compared with 30% in a previous series of pneumonia patients. A. S.

Determination of sulphapyridine in blood. E. G. Schmidt (J. Lab. clin. Med., 1939, **24**, 795—798).—The sulphapyridine of the blood can be accurately determined by the Marshall method on *p*-toluenesulphonic acid filtrates. On trichloroacetic acid filtrates, however. this method gives vals. which are low by 8%. The naphthoquinonesulphonic acid method on tungstic acid filtrates gives results which are 18% low. Both the latter can be corr. to give accurate results. C. J. C. B.

Treatment with septasine. S. Seiler (Schweiz. med. Wschr., 1939, **69**, 387—389).—Good results with septasine and solu-septasine were obtained in severe cases of tonsillitis, erysipelas, *B. coli* cystopyelitis, furunculosis, and septic phlebitis. A. S.

Absorption and excretion of 2-sulphanilylaminopyridine. E. J. Baines and R. Wien (Quart. J. Pharm., 1939, **12**, 4—18).—A method for the determination of the drug, based on that of Proom (A., 1938, III, 223), is described. 0·25 mg.-% of free amino-compound and 1·0 mg.-% of conjugated form can be determined. In men, mice, rabbits, and dogs, the drug is absorbed rapidly from the gastro-intestinal tract and appears in the blood within 1 hr. after oral administration; in man, the max. concn. is attained in 5—7 hr. In human blood, a concn. of 1 : 25,000 is attained after a single dose of 2 g., whilst repeated doses of 1 g. increase the concn. to approx. $1 : 10^4$. The drug is excreted almost entirely in the urine. Within 1 hr. of ingestion of 1 g. by a normal adult, the drug is present in the urine, 4—10% being excreted in 3 hr. and nearly all during 50 hr. Approx. equal amounts of the drug and its conjugated form are excreted. The max. urinary concn. is reached in 10—20 hr. J. N. A.

Phenothiazine. VIII. Antiseptic value of phenothiazine in urinary tract infections. F. De Eds, A. B. Stockton, and J. O. Thomas (J. Pharm. Exp. Ther., 1939, **65**, 353—371; cf. A., 1939, III, 83).—The clinical use of phenothiazine, in daily oral doses of 1·5—2 g. over a short period, cured 10 of 16 acute cases. 5 of 33 chronic cases were cured; 20 improved. Acidification of the urine, by administration of NH_4Cl, increased the bactericidal action. Secondary anæmia developed as a rare side action when the dosage was above the therapeutic range. E. M. S.

Effect of "mogral" on experimental tuberculosis in guinea-pigs. U. Sammartino (Arch. Farm. sperim., 1939, **67**, 137—145; cf. A., 1939, III, 617).—Prior administration has no preventive effect but administration after injection slightly alleviates the disease. F. O. H.

Action of some amines related to adrenaline : methoxyphenyl*iso*propylamines. J. A. Gunn, M. R. Gurd, and I. Sachs (J. Physiol., 1939, **95**, 485—500).—With the same phenyl nucleus, the *iso*propylamine side-chain renders a compound more toxic, more stimulant to the central nervous system, and less completely "sympathomimetic" than the corresponding compound with an ethylamine side-chain. Whether the side-chain be ethylamine or *iso*propylamine, a methylenedioxy-compound is more toxic, more stimulant to the central nervous system, and more completely "sympathomimetic" than a dimethoxy-compound. The presence of a hydroxyl group in the *para*-position renders a compound less toxic, less stimulant to the central nervous system, but more completely sympathomimetic than when there is H or methoxyl in this position. Many compounds of this type retain the power of producing the characteristic peripheral sympathomimetic actions of adrenaline in cats when they cease to produce these effects in rodents. If an additional phenyl nucleus is introduced into the methoxyl group in either the 3- or 4-position in dimethoxyphenyl*iso*propylamine the compound is rendered more stimulant to the central nervous system, but the stimulant action on smooth muscle is replaced by a depressant one. J. A. C.

Effect of continuous intravenous acetylcholine on the dog and cat. H. Scheiner (Compt. rend. Soc. Biol., 1939, **130**, 548—552).—When acetylcholine solutions are injected continuously intravenously into the dog or cat the initial depression of the blood pressure is not maintained. When high concns. are injected the recovery is not complete but in this case the pressure remains depressed even after the cessation of the injection. If eserine is injected before the acetylcholine the depression is maintained throughout the period of the injection. P. C. W.

Central heat production and its inhibition by aromatic amines and acetylcholine. S. Feitelberg, E. P. Pick, and A. von Warsberg (Arch. int. Pharmacodyn., 1939, **61**, 447—474).—In cats ephedrine and benzedrine increase the brain temp. by 1° as compared with carotid blood. Adrenaline is less active while sympathol and veritol are inactive. Acetylcholine causes a prolonged fall of brain temp. The heat-producing effects of ephetonine or adrenaline previously injected are not prevented by acetylcholine. The toxic effects of acetylcholine are not suppressed by atropine. D. T. B.

Action of adrenaline substitutes on smooth muscle. M. E. Drake, R. John, F. Renshaw, and C. H. Thienes (Arch. int. Pharmacodyn., 1939, **61**, 494).—Degeneration of the post-ganglionic nerve

fibres to the cat's and rabbit's iris and rabbit's intestine sensitises the muscle to the action of adrenaline, epinine, *m*-hydroxyphenylpropanolamine, etc. The denervated intestine was sensitised to propadrine, but not the iris. Denervated rabbit iris was sensitised to neosynephrine, but not the rabbit intestine or cat's iris. Paradrine contracted the intestine and had no effect on the cat's iris; it produced mydriasis in the normal rabbit's eye, but not in the denervated one. D. T. B.

Effect of diethylaminoethylephedrine coumarincarboxylate. K. Arai (Tohoku J. exp. Med., 1938, **33**, 219—223).—This compound acts on the central nervous system and smooth muscles less powerfully than the corresponding phosphate, thus causing a smaller rise in blood pressure. The relaxation of the bronchial muscles is greater than with the phosphate. It seems therefore more suitable for clinical application. F. Ja.

Vasodilating action of prostigmine. S. Perlow (J. Pharm. Exp. Ther., 1939, **66**, 66—72).—0·5 mg. of prostigmine, administered subcutaneously in the treatment of 2 cases of vasospasm, caused a rise in digital skin temp. The skin did not flush, but the histamine skin test increased in intensity. Oral administration of 15 mg. was effective in the vasospastic cases, but a normal subject responded to subcutaneous administration only. E. M. S.

Augmenting action of nicotine on adrenaline secretion from adrenals of non-anæsthetised dog. M. Wada, T. Hirano, and M. Tiba (Tohoku J. exp. Med., 1938, **33**, 189—212).—After an intravenous injection of nicotine (1 mg. per kg.) the output-rate of adrenaline showed the max. augmentation during the first 30 sec. At the same time the blood pressure fell abruptly but was raised during the second 30 sec. A rise of the blood-sugar level occurred more slowly. When the splanchnic nerves were cut there was a diminution of the increased output-rate of adrenaline. The dogs were not tied and the experiment caused no pain. F. Ja.

Action of nicotine on blood pressure in rabbits. M. Tiba (Tohoku J. exp. Med., 1938, **33**, 213—218).—No difference as compared with normal rabbits after nicotine injection was found in animals deprived of cœliac and superior mesenteric ganglia and adrenals. F. Ja.

Mechanism of the cardiac action of nicotine. I. First phase. (A) Action *in vitro* of nicotine and acetylcholine. (B) Perfusion *in situ* of the right auricle of rabbits. II. Second phase. III. Third phase. V. Gronchi (Boll. Soc. ital. Biol. sperim., 1939, **14**, 140—141, 142—144, 144—147, 147—149; cf. A., 1939, III, 454).—I. (A) Atropine inhibits the action of acetylcholine and also the 1st phase of nicotine action on the auricle of isolated rabbit's heart.

(B) Nicotine acts on both the intracardiac ganglia and the peripheral endings of the vagus.

II. The 1st and 2nd phases of nicotine action resemble the effects due to acetylcholine and adrenaline, respectively.

III. The 3rd phase of nicotine action is a replacement of stimulation (1st and 2nd phases) by paralysis of the intracardiac ganglia of the vagus. F. O. H.

Spleen-reducing effect of quaternary ammonium bases. L. Donatelli (Boll. Soc. ital. Biol. sperim., 1939, **14**, 168—169).—Intravenous administration of tetramethylammonium chloride, formate, or camphorsulphonate reduces the splenic vol. in dogs. F. O. H.

Knaffl-Lenz guinea-pig method for the assay of digitalis preparations. R. Marri (Boll. Soc. ital. Biol. sperim., 1939, **14**, 169—170).—The applicability of the (slightly modified) method (B., 1926, 995) to preps. from *Digitalis lanata* and *D. purpurea* is confirmed. F. O. H.

African arrow poison. R. Marri (Boll. Soc. ital. Biol. sperim., 1939, **14**, 170—171).—Biological tests indicated the poison to be of the digitalis type; chemical tests indicated strophanthin-*k*. F. O. H.

Action of digitalis on lipins. K. Westphal and K. Koch (Dtsch. Arch. klin. Med., 1939, **183**, 569—606).—Serum-lipins are lowered in cases of cardiac decompensation. Digitalis and strophanthin increase the lipin content of serum to normal or above normal (total cholesterol and esters; relative decrease of lecithin). Similar changes were found in digitalised hearts in dogs and rabbits. The cholesterol content of the adrenals is increased in rabbits; this can also be shown histologically. A. S.

Pharmacology of strophanthus therapy, with reference to *k*-strophanthoside. E. Rothlin (Münch. med. Wschr., 1939, **86**, 762—764).—The increasing order of potency of strophanthus glucosides on the frog (expressed in mg. per kg.) is: cymarin, *k*-strophanthoside, *k*-strophanthin (amorphous), *k*-strophanthin-β, ouabain. The order of potency in the cat (mg. per kg.) is: amorphous *k*-strophanthin, *k*-strophanthoside, *k*-strophanthin-β, cymarin, ouabain. Strophanthidin is in all cases the weakest. The lethal dose of *k*-strophanthoside on oral administration is in cats 4 mg. per kg. (30 times the lethal intravenous dose). Peroral administration is deprecated because of the wide fluctuations in intestinal absorption of the drug. A. S.

Intravenous strophanthin therapy. C. Kroetz (Münch. med. Wschr., 1939, **86**, 764—768).—The intravenous dose of *k*-strophanthoside is 0·25 mg. in cases of cardiac failure with œdema, and 0·15 mg. (max. dose per day 0·25 mg.) in patients without œdema once or twice daily. A. S.

Pharmacology of ouabain (acocantherin). R. A. Bullrich, O. F. F. Nicola, and H. J. Acevedo (Rev. Fac. Cienc. Quím. La Plata, 1938, **13**, 7—45).—Preps. of ouabain adsorbed by lipins with or without esterification (libain and ouabaioplastin respectively) are 4—5 times less toxic than ouabain when administered to dogs by continuous intravenous infusion, or to pigeons by intramuscular injection. Esterification alone (oleobain) causes less detoxication. The rate of toxic action is controlled by the rate of enzymic hydrolysis. The toleration of Indian rabbits for ouabain is too great for experiments with these to be of val. F. R. G.

Phenanthrene derivatives. VIII. Action of some phenanthrene derivatives on the isolated frog heart. E. E. Nelson (J. Pharm. Exp. Ther., 1939, **65**, 424—439).—A series of 15 N-containing derivatives of phenanthrene (cf. Small *et al.*, Suppl. 138 to U.S. Publ. Health Repts., 1938) produces a characteristic slowing of ventricular rate, associated with auriculo-ventricular block, but not modified by atropine. The power of recovery is related to the chemical structure of the compound. E. M. S.

Italian-grown *Digitalis lanata*, Ehrh. G. Pollacci and M. Gallotti (Boll. Soc. ital. Biol. sperim., 1939, **14**, 161—162).—Glucosides of greater stability and activity are yielded by *D. lanata* than by *D. purpurea*. F. O. H.

Lack of carcinogenic action of some cardiac glucosides and saponins. P. K. Smith and W. V. Gardner (Yale J. Biol. Med., 1939, **11**, 187—188).—Ouabain, *k*-strophanthin, strophanthidin, digitoxin, uzarin, and digitonin were not powerful carcinogenic agents. Mild carcinogenic properties could not be excluded owing to experimental limitations. A. G. M. W.

Effect of vagotonin on the sensitivity of the respiratory centre to carbon dioxide. R. Grandpierre, C. Franck, E. Stankoff, and M. Vidacovitch (Compt. rend. Soc. Biol., 1939, **130**, 503—506).—Injection of vagotonin in the chloralosed dog (5 mg. per kg.) increases the respiratory response to the inhalation of high-CO_2 mixtures. P. C. W.

Treatment of cough with drug combinations. W. H. Jansen and J. Weber (Münch. med. Wschr., 1939, **86**, 696).—Solvituss, a mixture of bromides, K cresolsulphonate, barbituric acid, phenyldimethylpyrazolone, and various aromatic oils, is recommended in the treatment of coughing. A. S.

Clinical experiences with ipedrin. D. Thomas (Münch. med. Wschr., 1939, **86**, 777—779).—Ipedrin (0·08 g. of ipecopan and 0·1 g. of ephedrine hydrochloride %) was successfully given by mouth in 200 cases of bronchitis, bronchial asthma, and emphysema. A. S.

Action of adenine compounds on [isolated] frog's intestine. J. Raventós (J. Physiol., 1939, **95**, 54—55P).—Adenosine causes relaxation at 1 in 5×10^8; adenosine triphosphate is 100 times less active and adenylic acid has 1/10 the activity of adenosine. Adenine produces inhibition only in high concn. (1 : 10,000). J. A. C.

Peptone derivatives of gelatin. IV. Anaphylactic shock with reference to the free amino-groups. T. Mori (J. Biochem. Japan, 1939, **29**, 1—11; cf. A., 1939, III, 198).—The toxicities (intravenous injection) of gelato-albumose and -peptone in rabbits are 0·15 and 0·25—0·40 g. per kg., respectively; 0·75 g. of the tryptone and 0·4 g. of gelatin per kg. are tolerated (all vals. expressed as wt. of N). Subcutaneous or intraperitoneal injection of 0·01 g. of the peptone 5—15 days after injection of 0·03 g. produces death by anaphylactic shock; the non-lethal effect persists after 30 days. Anaphylactic phenomena are also shown by the other derivatives but not by gelatin; a causative factor appears to be an NH_2-N content of 9—27% of the total N. F. O. H.

Denervated kidney. V. Effects of unilateral denervation in acute experiments on the uricosuric effect of cinchophen. G. P. Grabfield and D. Swanson (J. Pharm. Exp. Ther., 1939, **66**, 60—65; cf. A., 1938, III, 47).—Oral administration of cinchophen (300 mg.) to dogs with ureteric fistulæ decreased the urine flow and increased the excretion of uric acid. After denervation of the left kidney, cinchophen still diminished the flow, but no longer increased uric acid excretion in the urine from either kidney. It is concluded, from these and earlier results, that the effects of cinchophen on uric acid excretion are mediated by the adrenergic fibres to the kidney. E. M. S.

Influence of phenol-red and creatinine on the renal blood flow. J. F. Herrick, F. C. Mann, and H. L. Sheehan (J. Pharm. Exp. Ther., 1939, **66**, 73—78).—Measurements of renal blood flow in unanæsthetised dogs were made by a thermostromuhr method. For 10 min. after intravenous injection of either creatinine or phenol-red the blood flow varied. A rise was attributed to the injection of fluid; a fall to nausea. E. M. S.

Action of ergotoxine ergotinine and pseudo-ergotinine on diuresis. E. Zunz and O. Vesselovsky (Arch. int. Pharmacodyn., 1938, **60**, 466—489).—Ergotoxine diminishes the vol. of urine secreted after ingestion of water or urea but increases it during fasting or after NaCl. Ergotinine increases it during fasting or after water or NaCl, but diminishes it after urea. Ergotoxine, ergotinine, and ψ-ergotinine prevent the fall of Cl′ content in watery diuresis, but increase that of urea in saline diuresis. D. T. B.

Use of dismenol in spastic conditions of the urinary tract. E. J. Pirn (Med. Welt, 1939, **13**, 706).—Dismenol (*p*-sulphonamidobenzoic acid and dimethylaminophenazone) diminishes the contractions of the isolated guinea-pig's bladder and ureters, previously produced by pituitrin. The drug is recommended in cystitis and renal colic. A. S.

(A) Therapeutic index for coal-tar antipyretics. (B) Accuracy of a cross-over test. G. Brownlee. J. H. Gaddum (Quart. J. Pharm., 1939, **12**, 45—60, 60—65).—(A) The toxicities of phenazone, phenacetin, aspirin, amidopyrine, acetanilide, and *p*-aminophenol for rats are in the (increasing) order given. For mice, the order is acetanilide, phenazone, phenacetin, aspirin, and amidopyrine. The relative activities of these substances in lowering the rectal temp. of cats and rats with fever are the same. The therapeutic indices are determined for cats and rats using a cross-over test and phenacetin as a standard. With rats, the indices are acetanilide 170, amidopyrine 134, phenacetin 100, phenazone 100, and aspirin 74.

(B) The cross-over test and its accuracy are treated mathematically. J. N. A.

Treatment of epilepsy with sodium prominal. K. H. Stauder (Münch. med. Wschr., 1939, **86**, 736—739).—Oral administration of prominal in epilepsy is recommended, and details of dosage are given. A. S.

Relative hypnotic potencies and lethal values of the eight amylurea position isomerides and of the corresponding 5 : 5-diethyl-1-amylbarbituric acids. A. M. Hjort, E. J. de Beer, and D. W. Fassett (J. Pharm. Exp. Ther., 1939, **66**, 79—84; cf. A., 1935, 1488).—The potency and lethal effect of the amylureas increase in the order *n*-amyl, *iso*amyl, dimethylethylcarbinyl, *dl-sec.*-butylcarbinyl, *dl-n*-propylmethylcarbinyl, diethylcarbinyl, *dl-iso*propylmethylcarbinyl, *tert.*-butylcarbinyl. The first 4 and the 6th of the corresponding series of 5 : 5-diethyl-1-amylmalonylureas increase in potency and toxicity. E. M. S.

Effects of repeated anæsthetic doses of barbiturates. I. Nembutal. R. Hafkesbring, E. Greisheimer, and H. Magalhaes (J. Pharm. Exp. Ther., 1939, **66**, 95—98).—3 dogs were anæsthetised, at weekly intervals, with intraperitoneal nembutal (0·025 g. per kg.). During anæsthesia the respiratory rate decreased, the heart rate increased, and systolic (but not diastolic) blood pressure fell. Nembutal caused no significant variation in the results of blood investigations, and tests of kidney and liver function. E. M. S.

Cardiac response to posterior pituitary extract as affected by sodium phenobarbital. K. I. Melville (J. Pharm. Exp. Ther., 1939, **66**, 107—124).—The blood pressure and e.c.g. changes caused by posterior pituitary extract (cf. A., 1938, III, 1006) were intensified in dogs under phenobarbital anæsthesia. The fatal effect of postlobin-V (1·5 units per kg.) was prevented by previous coronary dilatation with ephedrine, adrenaline, or papaverine. In the heart–lung prep., phenobarbital directly depressed the myocardium. The increased sensitivity of the heart under phenobarbital is due to increase in the coronary constrictor action of pituitary extract as well as to direct myocardial action. E. M. S.

Action of pervitin on the accuracy of Widmark's blood-alcohol test. B. Siegmund (Dtsch. med. Wschr., 1939, **65**, 754—756).—The accuracy of Widmark's blood-alcohol test was not influenced in 2 subjects after administration of phenyl-β-methylpropylamine. A. S.

Pernocton twilight anæsthesia and fœtus. J. Klahn (Dtsch. med. Wschr., 1939, **65**, 793—795).—Fœtal asphyxia occurred frequently with pernocton twilight anæsthesia and morphine in cases of breech presentation and premature or delayed delivery. A. S.

Influence of age and weight of pigs on response to sodium evipan. H. P. Donald and J. Raventós (J. Pharm. Exp. Ther., 1939, **65**, 383—388).—In 50 pigs the duration of narcosis following intravenous evipan (20 mg. per. kg.) was recorded at intervals from birth to the age of 3 months. The new-born were most susceptible; from the age of 2 weeks the response was const. E. M. S.

Factors influencing duration of local anæsthesia. H. K. Sinha (J. Pharm. Exp. Ther., 1939, **66**, 42—53).—The human-wheal method was used to determine the duration of cocaine anæsthesia. Duration was influenced by the concn. used, rather than by the quantity, or the vol. of fluid. Anæsthesia was prolonged 6-fold by adrenaline in smaller concns. than those in clinical use. E. M. S.

Local anæsthetic action of certain pyrazoline compounds. H. K. Sinha (J. Pharm. Exp. Ther., 1939, **66**, 54—59; cf. A., 1936, 1146).—Derivatives of 1 : 5-diphenyl-3-(β-dialkylamino- or piperidino-ethyl)-pyrazolines have marked local anæsthetic properties. Activity is increased by increasing the size of the dialkylamino-group and by the introduction of alkyl or alkoxy-groups in the phenyl nuclei at positions 1 and 5. Toxicity is increased by increasing the size of the dialkylamino-group and by the introduction of alkoxy-groups into the 1-phenyl group; it is decreased by the introduction of alkoxy-groups in the 5-phenyl group. E. M. S.

Influence of anæsthesia on course of laparotomy. H. Finsterer (Med. Klin., 1939, **35**, 456—458). A. S.

Alkylaminoalkyl esters of aminonaphthoic acids as local anæsthetics.—See A., 1939, II, 321.

Effect of substituents on chemical, physicochemical, and biological properties of chemical compounds.—See A., 1939, I, 374.

Distribution of injected quinacrine in the blood. C. Lataste, M. E. Farinaud, and Nguyen-Van-Lien (Compt. rend. Soc. Biol., 1939, **130**, 522—525).—Quinacrine was injected into a patient (1·5 g. in 5 days) and determined daily in the blood cells and plasma. The concn. is max. on the 6th day and all the drug has disappeared on the 12th. The concn. in the blood is never higher than 4% of the total injected amount and there is a marked affinity for the erythrocytes. The concn. in the cells is three times that in the plasma. This is also found in *in vitro* experiments. The relation between concn. in cells and plasma is similar to that relating the solid content of cells and plasma. P. C. W.

Effect of the oral administration of drugs containing tannic acid on blood coagulation. Y. Noda (Tohoku J. exp. Med., 1938, **33**, 247—258).—Aq. extracts of *Galla*, *Catechu*, and *Geranium* introduced into the stomach of rabbits cause a shortening of the blood-coagulation time. This is due to their tannic acid which is converted into gallic acid which acts directly on the blood in the vessels, as it does *in vitro*, shortening the time of coagulation. F. Ja.

Intravenous administration of drugs acting on the uterus in labour. F. Hoff (Wien. klin. Wschr., 1939, **52**, 445—449).—Pituchinol (hypophysin + quinine) was intravenously injected post-partum. The time until delivery of the placenta was shortened and loss of blood was diminished. No untoward effects were observed. A. S.

Effect of magnesium on the response of the uterus to posterior pituitary hormones. A. M. Fraser (J. Pharm. Exp. Ther., 1939, **66**, 85—94).—During oxytocic assay of postlobin-V (pressor hormone) on the isolated uterus, it was found that the oxytocic activity increased when a Mg-containing solution was substituted for Locke's solution in the muscle bath. Raising the Mg content increased the

uterine response to the pressor and the oxytocic hormones. E. M. S.

Fate of calcium and magnesium after intravenous administration to normal persons. R. A. McCance and E. M. Widdowson (Biochem. J., 1939, **33**, 523—529).—Ca (0·186 g.) and Mg (0·219 g. per day), given intravenously, are rapidly excreted, but excretion by the gastro-intestinal tract bears no relation to the plasma level. P. G. M.

Histopathological changes in tissues after implantation of magnesium or other light metals. G. Kosaka (Fukuoka Acta Med., 1939, **32**, 15—16).—The implantation of Mg is followed by emphysematous changes and the formation of tunnel-like spaces in the surrounding tissues, owing to the production of $H^{\cdot}$ as the metal is corroded. Numerous collections of mononuclear and giant cells are present. The emphysema disappears when corrosion is complete. Karyorrhexis, karyolysis, cloudy swelling, and fatty degeneration occur in the surrounding cells. Healing is accomplished in the usual way by formation of granulation tissue and scar. W. d'A. M.

Treatment of angiomata by magnesium. G. Kosaka (Fukuoka Acta Med., 1939, **32**, 21—27).—Implantation of pieces of Mg or the injection of Mg powder in glycerin healed cavernous hæmangiomata (2 cases) and lymphangiomata (1 case). Mg stimulates the vascular endothelium, causes thrombosis with early organisation, and is itself destroyed by corrosion. W. d'A. M.

Effect of intravenous injections of magnesium sulphate on the vascular system. V. G. Haury (J. Pharm. Exp. Ther., 1939, **65**, 453—460).—In anæsthetised and spinal dogs, Mg (1—10 mg. per kg.) caused a fall in blood pressure and an increase in splanchnic vol., most marked in the kidney. The peripheral vasodilator action was confirmed by perfusion of frog's vessels. E. M. S.

Pharmacology of strontium. III. Action on smooth muscle fibres. A. Boriani (Arch. Farm. sperim., 1939, **67**, 119—136).—$Sr^{\cdot\cdot}$ has an excitatory action on smooth muscle to an extent approx. 2—3% of that of $Ba^{\cdot\cdot}$. F. O. H.

Treatment of surgical tuberculosis with rubrophen. H. Schaer (Schweiz. med. Wschr., 1939, **69**, 369—371).—41 patients suffering from various types of surgical tuberculosis were treated over long periods with oral administration of rubrophen. 13 patients were cured, 15 improved, and 13 did not respond. A. S.

Treatment of pulmonary tuberculosis with lipin-soluble silicic acid. H. Schaaf and A. Beumer (Wien. med. Wschr., 1939, **89**, 456—459).—Prolonged oral administration of silogran (ethyl silicyl-ricinoleate) is recommended in the treatment of light and moderately severe cases of pulmonary tuberculosis. A. S.

Action of silogran in pulmonary tuberculosis. F. Bach (Med. Klin., 1939, **35**, 640—641).—57 patients suffering from pulmonary tuberculosis were treated with oral administration of silogran. The formation of cirrhotic tissue in the lungs was promoted. A. S.

Gold treatment of infectious diseases. E. Frommelt and G. Scholz (Dtsch. med. Wschr., 1939, **65**, 748—750).—Good results obtained with repeated intramuscular injections of auro-detoxin (up to 20 g.) in various infectious diseases are discussed on the basis of 408 observations. A. S.

Experiments with AT 10. J. Jacobi and F. Tigges (Dtsch. Arch. klin. Med., 1939, **183**, 558—563).—AT 10 (irradiated ergosterol) was successfully used in cases of tetany and hypocalcæmia after thyroidectomy, sprue with hypocalcæmia, and idiopathic tetany with normal blood-Ca. It had no action in a case of pancreatic insufficiency, megacolon hypocalcæmia, and tetany, in a case of nephrosis with marked hypocalcæmia, or in osteitis fibrosa. A. S.

Micro-analysis of lead in body fluids [in lead poisoning]. II. G. Straube and H. Beck (Klin. Woch., 1939, **18**, 356—360).—There is no correlation between serum-, urinary, and fæcal Pb and the clinical signs of Pb poisoning; the vals. found in persons with Pb poisoning may approach the normal. E. M. J.

Change in toxicity of lead nitrate solutions with age. I. Simon (Boll. Soc. ital. Biol. sperim., 1939, **14**, 130—131).—Data for the lethal action of aq. $Pb(NO_3)_2$, intravenously injected 1—49 days after prep., are tabulated. F. O. H.

Peroral administation of salyrgan. P. Görl (Med. Klin., 1939, **35**, 578—579).—Salyrgan was given by mouth with satisfactory diuretic effects. A. S.

Antidotal action of sodium sulphide against mercury poisoning. I. Simon (Boll. Soc. ital. Biol. sperim., 1939, **14**, 137—138).—The antidotal action of Na_2S occurs when administered 1 hr. (with subsequent further doses) after ingestion of a lethal dose of $HgCl_2$ (cf. A., 1938, III, 228). F. O. H.

Rôle of copper in the attenuation of viper (*Vipera aspis*) venom by hydrogen peroxide. P. Boquet (Compt. rend., 1939, **208**, 770—772).—Venom (1 : 500 in "ordinary" distilled water), heated to 37° with H_2O_2 (100-vol. H_2O_2 diluted $\times 10^{2-3}$ with "ordinary" distilled water) for 20 hr., does not kill rabbits when injected intravenously with doses equiv. to 5 times the lethal dose of venom. Cu-free water prevents this action of H_2O_2. J. L. D.

Stramonium poisoning. N. G. Ionescu, P. Constantinescu, I. Stoian, and M. Soare (Bull. Mem. Soc. méd. Hôp. Bucarest, 1939, **21**, 90—93).—A case of severe poisoning by absorption through the skin is described. C. A. K.

Toxicity of ethylene oxide to *Calandra oryzæ*, *C. granaria*, *Tribolium castaneum*, and *Cimex lectularis*. J. R. Bosvine (Ann. Appl. Biol., 1938, **25**, 605—632).—The technique of toxicity determinations and the influence of physiological factors on the % kill of insects is examined. The relative order of resistance to HCN, SO_2, and ethylene oxide varied with the species tested. A. G. P.

Methyl bromide poisoning. M. Duvoir, R. Fabre, and F. Layani (Bull. Sci. pharmacol., 1939,

41, 15—26).—Poisoning by methyl bromide is due to a selective affinity for the vasomotor system and the effects appear to be ameliorated by vaso-constrictive substances (*e.g.*, adrenaline) and by glutathione. Methyl bromide can be detected principally in lipin-rich organs. H. G. R.

Treatment of gaseous hydrocyanic acid poisoning by sodium thiosulphate and sodium nitrite combination. J. N. Etteldorf (J. Pharm. Exp. Ther., 1939, **66**, 125—131).—Dogs were exposed to a known convulsive concn. of HCN. Up to 10 min. after exposure, intravenous $Na_2S_2O_3$ and $NaNO_2$ sometimes gave protection. 15 min. exposure was fatal, with or without treatment. Recovery is not possible after a fatal concn. of HCN has reached the blood and tissues. E. M. S.

Pharmacology of soaps. L. D. Edwards (J. Amer. Pharm. Assoc., 1939, **28**, 209—215).—The hæmolytic action of dil. aq. soap solutions on human erythrocytes is due to the fatty acid, probably through the mechanism of formation of acid soap. For each soap, there is an optimum p_H of hæmolysis which varies with the fatty acid. The Na soaps give a series of decreasing, max. hæmolytic activity (independently of p_H), and of decreasing toxicity to earthworm segments of laurate, myristate, palmitate, and stearate. Na and K soaps have similar activities. F. O. H.

Relation between chemical structure and toxicity of military [poison] gases. O. Ollila (Suomen Kem., 1939, **12**, A, 61—67).—A review. M. H. M. A.

Genalkaloids. Preparation and biological tests of genstrychnine. G. Gurmendi (Bol. Soc. Quím. Peru, 1938, **4**, 270—276).—The lethal dose for rats of strychnine oxide is 52 times that of strychnine. F. R. G.

Antidotes for quinine. I. Sodium chloride. II. Sodium sulphate. III. Disodium phosphate. IV. Tannic acid. I. Simon (Boll. Soc. ital. Biol. sperim., 1939, **14**, 131—132, 132—133, 133—134, 134—135).—Intravenous administration of min. lethal doses of quinine mono- or di-hydrochloride was followed within 5 min. by that of various doses of the above substances. In all cases, small and large doses were ineffective whilst intermediate doses prevented death. F. O. H.

"Delayed," minimal lethal, intravenous dose of sodium salts. Comparative toxicities of various anions. I. Simon (Boll. Soc. ital. Biol. sperim., 1939, **14**, 136—137).—The min. dose that, on injection at a concn. and rate not attended by immediate death, subsequently proves fatal was determined. The anions gave a series of increasing toxicity of NO_2' (0·0005), S_2O_8'', F', SO_3'', neutral tartrate, HPO_4'', I', acetate, H_2PO_4', NO_3', gluconate, Br', pyruvate, Cl', SO_4'' (0·0565 g.-equiv. per kg.). F. O. H.

Onion poisoning in horses. F. Thorp, jun., and G. S. Harshfield (J. Amer. Vet. Med. Assoc., 1939, **47**, 52—53).—7 of 9 horses which had access to a field in which were unharvested onions died, the symptoms being anæmia, icterus, and excretion of coffee-coloured urine. E. G. W.

Non-specific treatment of allergic conditions with pyrifer. R. Goldstein (Schweiz. med. Wschr., 1939, **69**, 389—390).—Good results were obtained in cases of bronchial asthma and chronic urticaria by causing hyperpyrexia by pyrifer. A. S.

Allergic reaction to menthol. W. Gronemeyer (Dtsch. med. Wschr., 1939, **65**, 756—757).—One case is described. A. S.

Lesions of the nervous system in rabbits with anaphylaxis. S. Baginski, E. Czarnecki, and J. Hurynowicz (Compt. rend. Soc. Biol., 1939, **130**, 567—569).—6 rabbits were given weekly injections causing anaphylaxis for 9 weeks. In the nervous system the chief findings were hyperplasia of the mesenchyme derivatives (adventitial cells of Marchand and microglia) and enlargement of the lymph spaces. The former process gave rise to necrotic areas. P. C. W.

Therapeutic use of sulphur-containing baths. A. Evers (Med. Welt, 1939, **13**, 597—599).—A review. A. S.

Treatment of skin diseases. A. Stühmer (Med. Welt, 1939, **13**, 657—662).—A review. A. S.

Device facilitating administration of capsules to animals. L. R. Lima (Surgery, 1938, **4**, 95—96).—A rubber tube and plunger for delivering capsules into the lower pharynx of dogs. G. K. H.

Homœopathic drug tests in healthy subjects. P. Martini (Münch. med. Wschr., 1939, **86**, 721—725).—Sepia, bryonia, secale, and S in homœopathic dilutions in normal subjects caused no symptoms. A. S.

Inhibitory influence of cerebrospinal fluid from dementia præcox cases on the genitals of male mice. H. Claude, H. Simonnet, and R. Stora (Compt. rend. Soc. Biol., 1939, **130**, 531—533).—The c.s.f. from 16 cases was injected into immature male mice (9 ml. per mouse injected during 7 days). 9 cases showed no effect but the other 7 showed varying degrees of inhibition of the growth of the sexual organs. The c.s.f. from these 7 cases exerted an inhibitory effect on simultaneously injected gonadotropic hormone. P. C. W.

(xxi) PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

Effect of glucose on muscular work. L. F. Dufour (J. Physiol. Path. gén., 1939, **37**, 101—109).—Ingestion of 100 g. per day of glucose by athletes enabled severe muscular exercise to be undertaken without the acidosis which occurred in the control period. The urine returned to normal with regard to p_H and Cl' and PO_4''' excretion. C. A. A.

Correlation of circulation and respiration as basis of individual working capacity. O. Bickenbach (Dtsch. Arch. klin. Med., 1939, **184**, 28—64). The results of the examination of 21 normal subjects in the course of a day's routine work are reported. A. S.

Constitution of adolescent child. Research on individual corrective work in schools. F. Schuck (Arch. Pediat., 1939, **56**, 199—209). C. J. C. B.

Skin potentials. F. Munk (Wien. klin. Wschr., 1939, **52**, 525—530).—The p.d. between palm and skin of the forehead may be up to 30—40 mv. There is no p.d. between symmetrical points of the body surface. Injection of 1 mg. of atropine or profuse sweating produced by aspirin has no action on the potentials. Normal skin potentials were found in cases of severe atrophy of skin and skeletal muscle, Parkinson's disease, tabes, and disseminated sclerosis. Cooling of the skin reduces the p.d. between two points of the surface; sneezing restores the p.d. to normal. A. S.

Action of permutit on lung tissue. A. Policard (Bull. Histol. Tech. micr., 1939, **16**, 18—31).—A detailed account of work already quoted (A., 1939, III, 513). E. E. H.

Solubility of quartz and silicates.—See A., 1939, I, 365.

(xxii) RADIATIONS.

Radiobiology of fast neutrons. K. G. Zimmer and N. V. Tivoféev-Ressovski (Strahlenther., 1938, **63**, 528—536).—The mutation rate of *Drosophila melanogaster* into F_2 when $P\,♂♂$ were irradiated with neutrons is raised. This rise is proportional to the r. equiv. but is less than the deep *X*-ray effect with corresponding r. val. E. M. J.

Distribution of radium in animals after injection. F. Daels, H. Fajerman, and van de Putte-van Hove (Strahlenther., 1938, **63**, 545—555).—0·0075—0·08 mg. of Ra was injected into normal, pregnant, or sarcomatous mice, rats, and guinea-pigs. Most of the Ra was found in the liver, kidney, lungs, bone marrow, and spleen. The placenta and fœtus both contain Ra. The humour and blood show Ra only on the first 3 days after injection. E. M. J.

Radiobiological experiments with *Drosophila* pupæ. A. Liechti, W. Minder, and J. H. Müller (Strahlenther., 1938, **63**, 689—700).—The damage curves for the pupæ under ultra-violet light, rays of 1·22 A., *X*-rays, and Ra are given and their significance for the "hitting" theory is discussed. E. M. J.

Basis of modern *X*-ray therapy. H. Holfelder (Strahlenther., 1939, **64**, 4—13). E. M. J.

Biophysical basis of internal radium and of radon therapy. B. Rajewsky (Strahlenther., 1939, **64**, 158—174).—A review. E. M. J.

Biological action of radium emanation. K. Nouye (Strahlenther., 1939, **64**, 175—200).—A fibroblast tissue culture in a medium containing 2·55 μg. of Ra element per c.c. shows inhibition of respiration and glycolysis; the same could be shown with thick sections (10 μ.) of Jensen rat sarcoma in a medium containing Rn. The inhibition is related to the strength of Ra emanation present and is 2½ times as strong at body temp. as at 5—7°. Leucocytosis was observed in persons subjected to a Rn bath; the max. was reached 4—5 hr. after the bath, and was followed by leucopenia. Products of radioactive decomp. are found mainly in blood-forming organs after protracted injection of Rn in saline into rats and rabbits. E. M. J.

Teleröntgenotherapy. L. Mallet (Strahlenther., 1939, **64**, 201—218).—A review. E. M. J.

Deep *X*-ray damage to the lung. I. R. Bauer. **II.** E. Schairer and E. Krombach (Strahlenther., 1939, **64**, 249—266, 267—290).—I. A fatal case of irradiation for mediastinal tumour is described; death was due to pulmonary fibrosis caused by a no. of courses of intensive deep *X*-ray therapy. No tumour cells were found post-mortem.

II. A review of the pathology of cases reported above. E. M. J.

Heating tissues by short waves. G. Wetzel and A. Kiesselbach (Strahlenther., 1939, **64**, 322—327).—Fresh bones or ox eyes were brought into stagnant or moving water and subjected to short waves; the rise of temp. was highest in the bone marrow and vitreous body respectively. E. M. J.

Biological action of sensitisers in visible light. A. Liechti, E. Feistmann, and L. Guggenheim (Strahlenther., 1939, **64**, 353—367).—Bacterial suspensions in saline could be sensitised against light containing the long waves of the visible spectrum by the use of the photographic sensitisers, erythrosin and dicyanine-*A*. The action is dependent on the suspension medium and the temp. E. M. J.

Ultra-violet dosimetry. III. Pigmentation by long-wave ultra-violet radiation. U. Henschke and R. Schulze (Strahlenther., 1939, **64**, 14—42).—So called long-wave ultra-violet radiation (λ above 320 mμ.) causes direct pigmentation without previous erythema; the max. is reached in 30—60 min. The gradation of the direct pigmentation becomes flatter with rising λ; individual sensitivity is independent of that to medium- and short-wave ultra-violet light. Protracted dosage decreases the effect; adaptation takes place but does not protect against light of the lower λ; anæmia of the skin (through pressure), prevents direct pigmentation. No histological changes were detected. E. M. J.

Dosimetry of fast neutrons. K. G. Zimmer (Strahlenther., 1938, **63**, 517—527).—A small condenser ionisation chamber described is useful for the dosimetry of fast neutrons. The no. of neutrons measured ionometrically or by the Ag indicator varies by 20%. Ionisation in tissue is 1·8 times that obtained in the chamber at 3·9-Mv. neutrons. E. M. J.

Dosimetry for radium applicators. E. Hasché and J. Bolze (Strahlenther., 1938, **63**, 701—707).—A method is described for measuring soft γ-rays and β-rays of Ra in addition to the hard γ-rays and a practical Roentgen unit is defined which has a definite relation to the r. unit. E. M. J.

Dosimetry in short-wave therapy. P. Wenk (Strahlenther., 1939, **64**, 328—334).—A watt-recording dosimeter is described. E. M. J.

Dose distribution in near radiation and body cavity valves. T. Zimmer (Strahlenther., 1939, **64**, 348—352). E. M. J.

Infra-red rays and the skin. L. Hill (Brit. Med. J., 1939, I, 977—978).—A review. C. A. K.

Effect of *X*-rays on the glucose and hexose phosphate glycolysis of tumour tissue. B. E. Holmes (Proc. Roy. Soc., 1939, **B**, **127**, 223—237).—That *X*-irradiation of tumour tissue at 0° inhibits anaërobic glycolysis is confirmed. A dose of *X*-ray sufficient to inhibit glycolysis does not inhibit the formation of lactic acid from hexose di- or mono-phosphate or glucose 1-phosphate. The reduction of methylene-blue by embryo brain tissue in the presence of lactic acid can be inhibited by γ-rays. It is probable that the lactic dehydrogenase enzyme itself is not damaged, since activity can be restored by the addition of co-enzyme I to the tissue. F. B. P.

Action of *X*-irradiation and radium on normal and neoplastic tissue. A. Goldfeder (Compt. rend. Soc. Biol., 1939, **130**, 571—572).—The necessary dosage of *X*-irradiation, Ra (γ-rays), and Rn ($\beta+\gamma$-rays) to prevent the growth of tissue cultures of normal tissues from man, mice, and rats as well as cultures of human myxo-sarcomata and Crocker mouse sarcomata was determined. The dosage for the different tissues was the same. The dosage necessary to produce a lowering of tissue metabolism was definitely greater. P. C. W.

Studies with seedlings on wave-length dependence of radiobiological reactions. P. S. Henshaw and D. S. Francis (Amer. J. Cancer, 1939, **35**, 386—400).—*Lycopersicum* and *Triticum* seedlings were exposed to 700-kv. and 200-kv. *X*-rays. The *Lycopersicum* seedlings were the more sensitive to the harder radiations and the difference was greater if the seedlings were surrounded by celluloid or Bakelite. E. B.

Photoperiodic action of light spectrum on Isaria summer barley. H. Ullrich and M. Canel (Naturwiss., 1939, **27**, 367).—The action of light in promoting the inflorescence of Isaria summer barley is greatest at 546·1 and 615·2 mμ. Blue and ultra-violet light and red light are little if at all active. W. O. K.

Nuclear and cytoplasmic effects of ultra-violet light. A. C. Giese (Science, 1939, **89**, 266—267).—In one series of experiments, the sperm of the sea urchin *Strongylocentratus purperatus* was irradiated, and then used to inseminate non-irradiated eggs: in another series the inseminated eggs were irradiated. The sperm was found more susceptible to radiation than was the fertilised egg, and this is attributed to its relatively exposed nucleus, *i.e.*, not covered by cytoplasm as is the inseminated egg. Susceptibility was measured by growth retardation. W. F. F.

Effect of γ-radiation on ovalbumin. J. A. Crowther and H. Liebmann (Nature, 1939, **143**, 598).—Exposure to increasing doses of γ-radiation alternately decreases and increases the electrophoretic mobility of ovalbumin. L. S. T.

Photodynamic action and the liberation of histamine. C. H. Kellaway and E. R. Trethewie (Austral. J. Exp. Biol., 1939, **17**, 61—76).—Histamine is liberated in perfused dog lungs by visible light in the presence of hæmatoporphyrin. It is destroyed *in vitro* by photodynamic action, but this destruction is inhibited by serum. The substance causing slow contraction of the guinea-pig jejunum is not liberated from the perfused dog lung by photodynamic action. No evidence was found for liberation of histamine by photodynamic action on the isolated jejunum of the guinea-pig. D. M. N.

Influence of monochromatic light on action of enzymes. XIV. Yeast-proteinase. XV. Yeast-lipase. XVI. Yeast-catalase. R. Murakami (J. Agric. Chem. Soc. Japan, 1939, **15**, 377—384; cf. A., 1939, III, 625).—XIV, XV. The actions of yeast-proteinase and -lipase are promoted by visible and ultra-violet light, the latter being the most effective.

XVI. The action of yeast-catalase is promoted by visible, and inhibited by ultra-violet, light. There is promotion with a mixture of visible and ultra-violet light, but this is less than for visible light alone. J. N. A.

(xxiii) PHYSICAL AND COLLOIDAL CHEMISTRY.

Influence of changes in salinity on the oxygen consumption of Cephalopoda. A. Raffy and R. Ricart (Compt. rend., 1939, **208**, 671—673; cf. A., 1934, 444).—*Sepia officinalis* and *Octopus vulgaris* rapidly acclimatise to dil. sea-water with [NaCl] of 2·23—3·02%. When the medium is changed, the O_2 consumption becomes irregular but is finally maintained at or above the initial level. Similar results are obtained in sea-water with added NaCl. J. L. D.

Magneto-chemical analysis of the sea-urchin (*Echinus melo*) egg. N. Perakis (Compt. rend., 1939, **208**, 1534—1536).—Virgin sea-urchin eggs suspended in sea-water have a coeff. of magnetisation of $-0{\cdot}69\times10^{-6}$ compared with that ($-0{\cdot}71\times10^{-6}$) of sea-water. The eggs, freed from Cl′ by washing with distilled water, are diamagnetic, this property being greatly reduced in the solid material obtained by drying the eggs. Extraction of the Cl-free eggs with alcohol and ether leaves a protein-containing material with diminished diamagnetic power, especially at low temp., which indicates that part of the material is non-diamagnetic. The ash is paramagnetic and contains traces of Fe (7 μg. per g. of solid). The alcoholic extract is equally diamagnetic with the Cl-free eggs and when ashed leaves a diamagnetic residue. The sperms are diamagnetic, and much less so when dried; the ash is feebly diamagnetic. J. L. D.

Fractionation of [serum-]proteins by electrodialysis. I. Effect of variation in p_H during electrodialysis on fractionation of proteins and of tetanus anti-toxic serum. II. Influence of concentration of proteins on fractionation of serum-globulins. A. V. Markovitsch and I. M. Chaustova (J. Appl. Chem. Russ., 1938, **11**, 1648—1656, 1657—1658).—I. Loss of antitoxin due to pptn. with iso-labile globulins during electrodialysis is greater when the p_H of the solution is initially above that of the isoelectric point of these globulins than when this is approached from the acid side. Loss of antitoxin due to cataphoretic deposition on the diaphragm takes place in solutions of p_H above

9·5 or below 6; in addition, inactivation due to denaturation proceeds in solutions of p_H above 9·5 or below 4·5.

II. The ratio of iso-stable to -labile globulin, as determined by electrodialysis, varies according to the total globulin concn., being related by a sigmoid curve to the latter. The ppt. is of the nature of a coacervate in the case of conc. solutions (exceeding 10%), and of a flocculate in that of dil. solutions. R. T.

Spectrophotometric study of the biuret reaction in investigation with the structure of proteins. I.—See A., 1939, II, 294.

Viscosity of serum-albumin in solutions of different hydrogen-ion concentrations. S. Thévenet (Compt. rend., 1939, **208**, 1119—1120; cf. A., 1937, III, 248).—1·18% serum-albumin in a Na_2HPO_4–citric acid buffer solution has a min. η (Ostwald) in the region of its isoelectric point (p_H 4·6—5·4). J. L. D.

Changes in optical activity of protein solutions in an alkaline medium. A. Boutaric and M. Roy (Compt. rend., 1939, **208**, 1120—1122; cf. A., 1937, III, 248; 1938, III, 872).—Serum-albumin solutions show a higher optical rotation in 0·5N- than in 0·01N-NaOH. The former racemises more rapidly than the latter on keeping, and more so at 33° than at 0°. Myxoprotein and globulin in 0·1N-NaOH racemise at 33°, but not at 0°. The rotation of the latter scarcely alters at 15°. J. L. D.

Variations in specific coefficient of magnetisation of oxyhæmoglobin in presence of soda and hydrochloric acid.—See A., 1939, I, 362.

(xxiv) ENZYMES.

Activity of the succinic dehydrogenase. (Sir) F. G. Hopkins, C. Lutwak-Mann, and E. J. Morgan (Nature, 1939, **143**, 556—557).—Pigs' heart and muscles and rabbits' skeletal muscles yield preps. of the succinic enzyme which, in presence of the substrate, actively reduce methylene-blue anaërobically, but are unable to induce O_2 uptake, even in a system containing adequate concns. of cytochrome-*C* and its oxidase. L. S. T.

Lactic dehydrogenase and cytochrome. M. Dixon and L. G. Zerfas (Nature, 1939, **143**, 557).—A partly-purified prep. of the lactic dehydrogenase of yeast failed to reduce cytochrome, although it still reduced other H acceptors such as methylene-blue. The purified enzyme behaves similarly, and an additional catalyst, present in crude preps., is necessary for the reduction of cytochrome. The catalyst is not identical with any of the known co-enzymes, the flavoproteins of yeast or muscle, or the flavin mono- or di-nucleotides. L. S. T.

Cytochrome and cytochrome oxidase. D. Keilin and E. F. Hartree (Proc. Roy. Soc., 1939, **B**, **127**, 167—191).—Cytochrome from heart muscle contains a fourth component, a_3, the absorption bands of which are fused with those of *a*. Fresh insect thoracic muscles, baker's yeast, and aërobic bacteria also contain a_3. Cytochrome oxidase, (a_3), may be identified with the respiratory enzyme of Warburg. It is thermolabile and sensitive to org. solvents, alkali, and acid, and undergoes a reduction under the same conditions as *a*, *b*, and *c*. It combines with CO in the reduced state, and with H_2S, NaN_3, and NH_2OH in the oxidised state. The similarity of *a* and a_3 in chemical structure and properties suggests that they are inter-convertible. F. B. P.

Enzymic hydrogenation of dehydrodeoxycholic acid by yeast. II. C. H. Kim (Enzymologia, 1939, **6**, 105—107; cf. A., 1937, III, 431).—When the yeast is replaced by the cell-free solution obtained by extracting yeast with PO_4''' buffer of p_H 7·14, a mixture of α- and β-3-hydroxy-12-ketocholanic acid is obtained from dehydrodeoxycholic acid. 3-Keto-12-acetoxycholanic acid is converted by a bottom-yeast fermentation of glucose–$NaHSO_3$ into α-3-hydroxy-12-acetoxycholanic acid. W. McC.

Flavin enzymes in the animal organism. E. Adler, H. von Euler, G. Günther, and M. Plass (Skand. Arch. Physiol., 1939, **82**, 61—78).—Enzyme solutions, obtained from acetone extracts of heart muscle, were treated with HCl in $(NH_4)_2SO_4$; an apo-enzyme was produced which combined with flavin adenine dinucleotide to form a dihydrocozymase dehydrogenating holo-enzyme. This flavin-containing dihydrocozymase has the same action as diaphorase. Heart muscle contains further an enzyme which transfers H from dihydrocodehydrogenase II to methylene-blue and is not identical with diaphorase or dihydrocozymase. The flavin-dihydrocozymase is not identical with flavin enzyme of yeast (flavin–phosphoric acid–protein). A. S.

Isolation and properties of a flavoprotein from heart muscle. F. B. Straub (Biochem. J., 1939, **33**, 787—792; cf. A., 1939, III, 359).—The prep. and purification of a flavin adenine dinucleotide from pig's heart muscle are described. Absorption max. occur at 274, 359, and 451 mμ., by means of the last of which the lactoflavin content has been determined as 0·54±0·02%. This indicates a mol. wt. of 70,000. The dinucleotide can replace the co-enzyme of the *d*-amino-acid oxidase, and is thus shown to be the prosthetic group of the flavoprotein. This protein (N 15·7%) is in an insol. state in the tissue. It is reduced to a leuco-compound by $Na_2S_2O_4$ and reoxidised in air. Its solutions fluoresce strongly and are not appreciably inactivated (10%) by heating at 70° for 5 min. P. G. M.

Catalytic function of heart flavoprotein. H. S. Corran, D. E. Green, and F. B. Straub (Biochem. J., 1939, **33**, 793—801).—The mechanism of the catalysis of the oxidation of dihydropyridine nucleotides by carriers such as methylene-blue involves reduction of flavoprotein by reduced co-enzyme, followed by oxidation by the carrier. Heart flavoprotein is 353 times as active as the Warburg–Christian yeast flavoprotein in this respect, and each mol. catalyses the oxidation of 8500 mols. of reduced co-enzyme I per min. It is identical with diaphorase (co-enzyme factor). P. G. M.

Oxidation of codehydrogenase I. V. R. Potter (Nature, 1939, **143**, 475—476).—Experiments

showing that diaphorase is a powerful, widely-distributed, malonate-insensitive enzyme which catalyses the transport of dihydrocozymase H to natural carriers capable of bringing this H ultimately to O are recorded and discussed. L. S. T.

Diaphorase I and II. E. Adler, H. von Euler, and G. Günther (Nature, 1939, **143**, 641—642).—In addition to diaphorase I, which transports H from dihydrocodehydrogenase I to acceptors such as methylene-blue or cytochrome, animal tissues contain another enzyme, now named diaphorase II, which catalyses the analogous reaction for dihydrocodehydrogenase II. This enzyme is probably a flavoprotein. L. S. T.

Ascorbic acid oxidase. II. Purification and properties. III. Peroxidase in purified preparations. T. Ebihara (J. Biochem. Japan, 1939, **29**, 199—215, 217—223; cf. A., 1939, III, 321).—II. The aq. extract of cucumber rind is treated with Ba acetate and the centrifuged extract 5%-saturated with $(NH_4)_2SO_4$; removal of the ppt. and further addition of $(NH_4)_2SO_4$ gives a ppt. which is dissolved in water and dialysed. The oxidase thus obtained has optimum p_H and temp. of 6·0—6·5 and 37—40°, respectively. The oxidation of ascorbic acid (to dehydroascorbic acid) by the enzyme is proportional to the concn. of enzyme and independent of concn. of substrate; it is a bimol. reaction. Oxidation, during which H_2O_2 is formed, is effected by O_2 but not by methylene-blue. The enzyme, which appears to be sp. for ascorbic acid, is inhibited by CO, CN′, Na_2S, and substances capable of forming complexes with heavy metals.

III. Purified preps. of the oxidase always contain peroxidase, but not polyphenol- or indophenol-oxidase. The peroxidase is more thermostable than is the ascorbic acid oxidase; also, only the peroxidase is inhibited by NH_2OH, phenylhydrazine, $K_4Fe(CN)_6$, 2-aminophenol-4-sulphonic acid, and, to the extent of 75%, by 10^{-5}M-KCN. The distribution of ascorbic acid oxidase, peroxidase, and catalase in plant and animal tissues was determined. F. O. H.

Amine oxidase and diamines. Action of guanidine. H. Blaschko (J. Physiol., 1939, **95**, 30p).—Amine oxidase has no affinity for histamine and diamines. Histaminase reacts only with substances with two amine groups. Guanidine is a competitive inhibitor of histaminase and shares this property with dimethylguanidine; other guanidine derivatives, *e.g.*, creatine and arginine, have no affinity for the enzyme. J. A. C.

Preparation of natural amino-acids from racemates by means of *d*-amino-acid oxidase.—See A., 1939, II, 302.

Specificity of *d*-amino-acid oxidase. K. Felix and K. Zorn (Z. physiol. Chem., 1939, **258**, 16—26; cf. A., 1937, III, 305).—At p_H 7·6 during 3—8 hr. the oxidase, in extracts of dried pig kidney, attacks only non-naturally occurring amino-acids, $\frac{1}{2}O_2$ being usually consumed per mol. of amino-acid degraded and per mol. of NH_3 produced. Usually, the yield of the corresponding keto-acid (titrated and/or isolated as 2 : 4-dinitrophenylhydrazone) produced is good. The degradation of *d*-leucine and *d*-glutamic acid is slow and incomplete but *d*-alanine, *d*-valine, *d*-aminobutyric acid, *d*-aspartic acid, *d*-norleucine, *d*-phenylalanine, *d*-tyrosine, and *d*-dihydroxyphenylalanine are very readily degraded. Glycine and *d*-lysine are not degraded and *d*-arginine and *d*-serine only slightly. Glycine is also not attacked by fresh liver or kidney pulp or slices. The extracts oxidise also putrescine and cadaverine with liberation of 1 NH_3, the corresponding aldehydes and probably also γ-aminobutyric acid and δ-aminovaleric acid respectively being produced. Agmatine is less readily oxidised, less than 1 O being consumed and less than 1 NH_3 produced. Colamine and tyramine are not attacked by the extracts. W. McC.

Substrate specificity and inhibition characteristics of two copper–protein oxidases. J. F. McCarthy, L. F. Green, and C. G. Green (J. Biol. Chem., 1939, **128**, 455—462).—With $Cu^{..}$ or Cu–albumin as catalyst, *d-iso*ascorbic acid is oxidised slightly more rapidly than *l*-ascorbic acid; with cucumber oxidase the rates are identical, but potato oxidase has no catalysing effect (cf. Johnson and Zilva, A., 1937, III, 392). Pyrocatechol is oxidised rapidly by potato oxidase but not by $Cu^{..}$, Cu–albumin, or cucumber oxidase. Typical Cu "poisons" inhibit cucumber and potato oxidase. CN′ inhibition of cucumber oxidase is not reversed by dialysis. E. M. W.

Fermentation process in tea manufacture. II. Properties of tea peroxidase. III. Mechanism of fermentation. E. A. H. Roberts (Biochem. J., 1939, **33**, 836—852; cf. B., 1938, 1493).—H_2O_2 required in the oxidation of tea-tannin by peroxidase arises from the aërobic oxidation of ascorbic acid, which controls the rate of the whole process. 1 O is absorbed per mol. of tannin during fermentation, the resulting product then undergoing an irreversible condensation. The arguments for and against tea-tannin and quercetrin as O carriers are discussed. Glucose is identified as the fermentable non-tan. P. G. M.

Crystalline horse-liver catalase. A. L. Dounce and O. D. Frampton (Science, 1939, **89**, 300).—Crystals (fine needles) of this catalase have been obtained by fractional pptn. with dioxan, and the slow addition of $(NH_4)_2SO_4$ to a buffered dioxan solution. The hæmin content is ~0·9, but the Cu content is practically negligible (cf. A., 1938, III, 951). Acetone and HCl split off the hæmin, which dissolves in the acetone. L. S. T.

Cocarboxylase (vitamin-B_1 diphosphate) in blood. R. S. Goodhart and H. M. Sinclair (J. Physiol., 1939, **95**, 57—59p).—There is no cocarboxylase activity of blood unless it is heated. Vals. (mean in μg. per 100 ml.) obtained are human, 7·0±1·9; ox, 5·7±1·5; pigeon, 20·2±9·8; avitaminous pigeon, 5·6±0·8. Plasma contains practically no cocarboxylase, even after boiling or digesting with pepsin. Nucleated blood cells that have originated in bone marrow convert vitamin-B_1 into cocarboxylase which is combined probably with protein. The cells are incubated with -B_1 in PO_4''' buffer (p_H 6·2) at 38°; the leucocyte layer (730,000

cells per cu. mm.) of the blood from a patient with myeloid leukæmia contained 124 μg. per 100 ml. before incubation and 174 μg. afterwards, whereas the leucocyte layer (360,000 cells per cu. mm.) of blood from a patient with lymphatic leukæmia contained 17·5 μg. per 100 ml. and showed no synthesis. J. A. C.

Action of the esterases of pancreas and liver on polyhydric alcohols, carbohydrates, and their esters. S. J. von Przyłęçki and E. A. Sym (Enzymologia, 1939, **6**, 135—139).—Experiments with butyric acid show that the esterases of pancreas and liver preferentially catalyse the esterification of aliphatic monohydric primary alcohols (C_1 to C_{16}) and the hydrolysis of the esters. Methyl alcohol is the most readily esterified and eliminated but the extent of esterification and hydrolysis is not much affected by the length of the C chain of the alcohol. *sec.* Alcohols and their esters are much less readily influenced by the esterases and adjacent ·OH groups (*e.g.*, in glycerol, erythritol) inhibit the reaction. Glyceraldehyde, arabitol, mannitol, inositol, and glucose are not esterified but pancreatic esterase catalyses the hydrolysis of glyceraldehyde di-, erythritol tetra-, glucose penta-, and mannitol hexa-acetate and the hydrolysis of the erythritol and glucose esters is catalysed also by liver-esterase although the rate and degree of hydrolysis are very small. The failure of the esterases to catalyse esterification in cases where they catalyse hydrolysis of the corresponding esters is possibly due to the insolubility of the mono- or di-esters which are first to be produced. W. McC.

Transformation of *d*- into *meso*-tartaric acid by pancreas. M. Betti and E. Lucchi (Ber., 1939, **72**, [*B*], 1100).—In water at room temp. the transformation appears to be quant. H. W.

Enzyme system of trans-amination, its mode of action and biological significance. A. E. Braunstein (Nature, 1939, **143**, 609—610).—Recent investigations on the transfer of NH_2-groups between amino- and keto-acids are discussed. The range of specificity and the mode of action of a new group of intracellular enzymes, termed aminopherases, are surveyed. The biological significance of these enzymes and of the dicarboxylic amino- and keto-acids is discussed. L. S. T.

Enzyme system transferring the amino-group of aspartic acid. M. G. Kritzmann (Nature, 1939, **143**, 603—604).—Enzyme preps. catalysing the trans-amination of aspartic acid at a considerable rate in presence of a thermostable co-enzyme have been obtained from muscle tissue. The preps. still contain the enzyme of glutamic acid trans-amination (A., 1938, III, 420), which, however, is inactive towards the trans-amination of aspartic acid. Preps. that are active only towards aspartic acid can be obtained from vegetable sources. L. S. T.

Isolation of the enzyme effecting transfer of the amino-group of glutamic acid. M. G. Kritzmann (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 42—43).—The enzyme transferring the amino-group from glutamic to α-ketoglutaric acid is isolated from aq. $KHCO_3$ extracts of pigeon muscle or pig heart by pptn. with acetic acid at p_H 4·5. The washed and vac.-dried ppt. is stable, but when dehydrated by acetone or alcohol is rendered inactive. Activity is max. at p_H 7·5, is not affected appreciably by heating (20 min.) at 70°, but is rapidly destroyed at 85°. The enzyme does not act on aspartic acid. A. G. P.

Purification of uricase. C. G. Holmberg (Nature, 1939, **143**, 604).—Preps. 1000—1400 times as active as the acetone powder of pig's liver used as starting material have been obtained. The preps. are colourless, insol. in water, only slightly sol. in alkaline buffer solutions, and contain 0·02% of Fe. The catalytic activity is poisoned reversibly by KCN, but not by H_2S, 2 : 2′-dipyridyl, P_2O_7'''', or diethyl dithiocarbamate. The lack of correlation between [Fe] and activity in preps. obtained by different methods and the low % of Fe in highly-purified preps. make it improbable that Fe is a constituent of uricase (cf. A., 1938, III, 616, 844). L. S. T.

Anaërobic decomposition of cysteine by *Bacterium coli*. I. Cysteinase. P. Desnuelle and C. Fromageot (Enzymologia, 1939, **6**, 80—87).—*B. coli*, anaërobically grown in Liebig's broth, does not contain an enzyme capable of decomp. cysteine; when cysteine is added to the broth, however, an enzyme (" cysteinase ") is elaborated which splits off equimol. amounts of H_2S and NH_3 from cysteine, the optimum p_H being 6·4. Previously published results (A., 1937, III, 312; 1938, III, 958) are withdrawn. F. O. H.

Egg-white lysozyme. E. P. Abraham (Biochem. J., 1939, **33**, 622—630).—Lysozyme prepared by Roberts' method (A., 1938, III, 73) yields arginine, lysine, and cystine on hydrolysis. Although the enzyme appears to be homogeneous in the ultra-centrifuge and to have a mol. wt. of approx. 18,000, it is not a single protein, a portion of it being only slightly sol. in water and having a lower activity. Electrometric titration of the sol. enzyme shows it to be a basic protein with an acid-binding capacity of approx. 23 groups per mol. At p_H 11·5 and 25°, the base-binding power in water corresponds with approx. 15 groups per mol., whilst for the insol. fraction the vals. are 24 and 21, respectively. J. N. A.

Lysozyme, its properties and its applications. Z. V. Jermoljeva and I. Biujanovskaja (Acta Med. U.R.S.S., 1938, **1**, 248—257).—A review. T. T.

Nuclein-deaminases. II. Riboadenylic acid-deaminases. Y. Wakabayasi (J. Biochem. Japan, 1939, **29**, 247—263; cf. A., 1939, III, 197).—Animal tissues contain an enzyme which deaminates yeast-adenylic acid and is always accompanied by nucleotide-phosphatase and adenosine-deaminase; the last two enzymes are eliminated by treatment with Lloyd's reagent (or addition of F′) and extracting the tissue with 2% aq. $NaHCO_3$, respectively. All the tissues examined contained an enzyme deaminating muscle-adenylic acid; in no instance was adenine-deaminase detected. F. O. H.

Phosphoserine and its enzymic hydrolysis. T. Sorimati (J. Biochem. Japan, 1939, **29**, 289—305). —Pepsin–trypsin hydrolysates of caseinogen are treated with Pb acetate, the ppt. is regenerated, and

the resulting solution pptd. with acetone. This affords a phosphopeptone (for Ba derivative, P : N : Ba = 1 : 5 : 2) which is hydrolysed (HCl) to serinephosphoric acid (*Ba* salt). With acid hydrolysates of caseinogen, a similar technique yields phosphoserylglutamic acid (*Ba* salt). Serine phosphate and phosphoserylglutamic acid are readily hydrolysed by phosphomonoesterases with p_H optima at 9 and 5·6, respectively, but not by that with p_H optimum at 3·2. F. O. H.

Glycinebenzoacylase. H. Mori (J. Biochem. Japan, 1939, **29**, 225—240).—The prep. of a histozyme (from pig's kidney) which hydrolyses hippuric acid but not benzoyl-asparagine or -tyrosine or phenacylglycine is described (cf. Nawa, A., 1939, III, 196). The enzyme ("glycinebenzoacylase") hydrolyses acetyl- and chloroacetyl-glycine and -asparagine and phenylpropionylglycine, but not cinnamoylglycine. F. O. H.

Effect of various enzymes on carnosine. A. Sasaki (J. Biochem. Japan, 1939, **29**, 333—337).—Carnosine is hydrolysed by maceration juice of liver (rabbit, pig, fish) at weakly alkaline reactions (with fish-liver enzyme, the optimum p_H is 7·4) but not by maceration juices of other tissues or intestinal enzyme preps. which hydrolyse glycylglycine. F. O. H.

Hydrolysis of acropeptides by pancreatic proteinase. N. Lichtenstein (Enzymologia, 1939, **6**, 108—112; cf. Fodor and Kuk, A., 1938, III, 953).—Acropeptides from caseinogen, edestin, and gelatin are hydrolysed by pancreatic proteinase, the extent of hydrolysis being increased if protaminase is also present. Closed polypeptide chains in the acropeptides are opened during the hydrolysis which, apparently, does not have any other effect. After treatment with the proteinase, the acropeptides do not resist attack by yeast-polypeptidase. W. McC.

Enzymes in snake venom. V. Detection of dipeptidase, polypeptidase, carboxypolypeptidase, and esterase in different snake venoms. B. N. Ghosh, P. K. Dutt, and D. K. Chowdhury (J. Indian Chem. Soc., 1939, **16**, 75—80; cf. A., 1939, III, 323).—The venoms from *Naja naja*, *B. fasciatus*, *Echis carinata*, and *Vipera russellii* contain a dipeptidase (hydrolyses glycylglycine and *l*- but not *d*-leucylglycine), a polypeptidase (hydrolyses *l*- but not *d*-leucylglycylglycine), and a carboxypolypeptidase (hydrolyses chloroacetyl-*l*-tyrosine). That of *N. naja* and *B. fasciatus*, but not that of *E. carinata*, *V. russellii*, or *Crotalus t. terrificus*, contains a choline-esterase. R. S. C.

Chromatographic analysis of chitinase. L. Zechmeister and G. Tóth (Naturwiss., 1939, **27**, 367).—The chitinase, separated from emulsin by chromatographic analysis employing bauxite as adsorbent, can be further split by chromatographic treatment into two components, one of which acts on chitodextrin prepared by partial hydrolysis of chitin, the other on chitobiose *N*-diacetate. The chitin-splitting enzyme of *Helix pomatia* can likewise be separated into two components. W. O. K.

Compounds of clupein with prosthetic groups. II. Prosthetic group in pepsin. K. Felix and A. Mager (Z. physiol. Chem., 1939, **259**, 36—44; cf. A., 1937, III, 455).—Commercial pepsin, purified by dialysis, is treated with trypsin or dil. H_2SO_4 at 37°. When the resulting mixture is dialysed against water, the residue and dialysate are both inactive. If a methyl-alcoholic solution of clupein methyl ester is added to the dialysate a ppt. "pepsin-clupein" is obtained which possesses enzymic properties similar to pepsin. The yield of this product, which contains 17·8% of N, is 20—30%. It gives an intense pentose reaction. If alcohol or acetone instead of clupein is added to the dialysate the ppt. obtained contains the prosthetic group of the original pepsin. This contains P and N and gives very strong pentose and Feulgen nucleal reactions. The calc. equiv. of the prosthetic group is 220. J. N. A.

Effect of the pancreatic juice and trypsin on polypeptides. S. Fujita (Tohoku J. exp. Med., 1938, **34**, 386—392).—The activated pancreatic juice of rabbits which will break down casein does not act on glycyl-, *dl*-alanyl-, or *dl*-leucyl-*l*-tyrosine, glycyl- or *dl*-leucyl-*d*-glycine, *dl*-leucyl-*dl*-alanyl-*l*-tyrosine, or *d*-glycyl-*l*-phenylalanine. Trypsin (Grübler), although fully active towards casein, will not hydrolyse glycyl-, diglycyl-, or *dl*-leucyl-glycine, glycyl-*l*-phenylalanine or -*l*-tyrosine, *dl*-leucyldiglycine, or *dl*-leucyl-*dl*-alanyl-*l*-tyrosine. Chloroacetyl-*l*-tyrosine was hydrolysed both by the pancreatic juice and by trypsin. F. Ja.

Survival of cathepsin in autolysis. H. Eder, H. C. Bradley, and S. Belfer (J. Biol. Chem., 1939, **128**, 551—557).—Liver pulp (pig) was incubated at varying acidities, N and tyrosine in trichloroacetic acid filtrates being used as a measure of digestion. Reactions more acid than p_H 3 lead to rapid, and more alkaline than p_H 5 to gradual, destruction of cathepsin, whilst at p_H 3·5—5, activity is maintained for several weeks, proteolysis of all liver-proteins except connective tissue stroma being complete. Below p_H 3, inactivation of enzyme, and above p_H 5, lack of available substrate, limit digestion. T. F. D.

Natural activator of papain. M. Frankel and R. Maimin (Nature, 1937, **140**, 1015).—The natural activator of papain present in the latex of *Carica papaya* is separated from the enzyme system by dialysis, pptn., and other procedures. Hydrolysis of peptone by papain but not that of gelatin is stimulated by the activator, which is probably identical with glutathione. The natural activator and low concn. of glutathione inhibit, but higher concns. of glutathione stimulate, the hydrolysis of gelatin. The degree of activation of peptone hydrolysis by low concn. of glutathione is equal to that produced by HCN. W. McC.

Gelatinase of *B. perfringens* A. E. Pozerski and A. Guélin (Compt. rend. Soc. Biol., 1939, **130**, 609—610).—The gelatinase is not diffusible when the organism is grown on a glucose–salt medium with the addition of a small quantity of glucose broth but is diffusible if the broth alone is the medium. H. G. R.

Hydrolase activity of the contents of the cæcum in horses and of the rumen of cattle. E. A. Sym, W. Stankiewicz, and F. Zielinski (Enzymologia, 1939, **6**, 113—121; cf. A., 1939, III, 198).—The proteinases of the cæcum of the horse are derived from pancreatic trypsin but those of the rumen of the cow are probably of bacterial origin. The lipases and amylases of the cæcum are of animal, those of the rumen probably of vegetable, origin. In the rumen, proteolytic and lipolytic activity is much weaker than in the cæcum. The proteolytic, lipolytic, and amylolytic enzymes of the cæcum and rumen occur for the most part attached to solid matter and act in that condition. The optimum p_H for the lipases is 7·2, those of the amylases 7·4 (cæcum) and 5·2 (rumen), and those of the proteinases (trypsin) 8·7—9·5 (cæcum) and 7·3 (rumen). Proteolysis in the cæcum is greatly accelerated by high redox potential but otherwise the action of the enzymes is not affected by the potential. The amylase of the cæcum is of the saccharifying type, that of the rumen being dextrin-producing. W. McC.

Dried natural digestive juices. W. N. Boldyreff, W. B. Lewis, and C. E. Stewart (Tohoku J. exp. Med., 1938, **33**, 224—229).—The properties of the juices before and after drying are given. A special method of drying so as to prevent autodigestion during the procedure is described. F. Ja.

Non-hydrolytic degradation products of fibrin. Action of proteinases on them.—See A., 1939, II, 294.

Enzymes in young mycelia of *Aspergillus oryzæ*. Y. Otani (Bull. Agric. Chem. Soc. Japan, 1939, **15**, 59—64).—The solution obtained by extraction of 1 g. of dry powdered mycelium with 100 c.c. of water at 40° for 4 hr. contains β-*h*-fructosidase, α- and β-*d*-glucosidases, β-*d*-galactosidase, α- and β-amylases, a proteinase of papain type, a peptidase, rennin, urease, catalase, peroxidase, and indophenolase. The last two gave only weak reactions. J. N. A.

Difference between cellulase and lichenase. I. Enzymic decomposition of polymeric carbohydrates. K. Freudenburg and T. Ploetz (Z. physiol. Chem., 1939, **259**, 19—27).—Cellulase and lichenase are two distinct enzymes. When "luicyme" (a mixture of enzymes obtained from *Aspergillus oryzæ*) is stirred with water, centrifuged, and the resulting brown solution is dialysed for 16 hr. a solution of enzymes is obtained which is then submitted to a series of fractional pptns. with alcohol–ether. In this way lichenase, cellulase, and cellobiase are obtained, the p_H optima of which are 5·9, 4·7, and 5·9 respectively. In a similar way the above three enzymes can be obtained from the gastric juice of *Helix pomatia*, the p_H optima of cellulase and lichenase in this case being 5·2—5·5 and 5·2 respectively. The rate of hydrolysis of cuprophane by cellulase is greater, the greater is the amount of enzyme. Hydrolysis is rapid at first, but gradually slows down, due either to inactivation of the enzyme or to inhibition of the reaction by the sugar formed. J. N. A.

Pectic enzymes. III. Heat-inactivation of tomato pectin-methoxylase (pectase). Z. I. Kertesz (Food Res., 1939, **4**, 113—116; cf. A., 1939, III, 99).—The pectase of tomatoes is completely inactivated by heating the juice at 80° for 45 sec. To test for destruction of pectase, 1 c.c. of the juice is added to 25 c.c. of a slightly acid solution of pectin and the mixture is titrated with 0·1N-KOH (methyl-red) until the last pink tint is lost. The mixture should show no change of colour at room temp. in 1 hr. E. C. S.

Destruction of hydrocyanic acid by prunase and influence of sugars on the reaction. J. F. Couch and R. R. Briese (J. Washington Acad. Sci., 1939, **29**, 219—221).—At 25°±0·5° prunase slowly destroys aq. HCN. The rate of destruction is diminished by adding sucrose or, less effectively, glucose but the retardation becomes noticeable only after approx. 15—20 days. The carbohydrates probably act on free HCN and do not affect the enzymic liberation of HCN from the plants. W. McC.

Serum-phosphomonoesterases showing activity at weakly acid reaction. E. Lundsteen and M. Vermehren (Enzymologia, 1939, **6**, 27—32).—The serum of a patient with cancer of the prostate and metastases of the bones contained "acid phosphatases," probably identical with those described by Kutscher *et al.* (A., 1936, 759). A method for determining such phosphatases in serum, based on the liberation of inorg. P from Na α-glycerophosphate in dil. HCl, is described. F. O. H.

Synthetic action of almond-phosphatase. J. Courtois (J. Pharm. Chim., 1939, [viii], **29**, 433—446; cf. A., 1938, III, 1050).—Little phosphorylation occurs as a result of adding phosphatase from sweet almonds to mixtures of alcohol and PO_4''', but at p_H 5·4—7·7 considerable phosphorylation of glycerol occurs, equilibrium being attained when approx. 20% esterification has occurred. α-Glycerophosphate only is produced. Esterification is inhibited by I, H_2S, ascorbic acid, and high concns. of PO_4'''. The extent of esterification depends on the redox potential of the medium and is favoured by oxidising media (*e.g.*, H_2O_2). In addition to the reaction glycerophosphate $\rightleftharpoons$ glycerol + phosphate there occurs the reaction α-glycerophosphate $\rightleftharpoons$ β-glycerophosphate in which the equilibrium very greatly favours the α-compound. W. McC.

Identification of two "alkaline" phosphatases in animal organs. R. Cloetens (Enzymologia, 1939, **6**, 46—56).—A study of the hydrolysis of Na β-glycerophosphate at p_H 9·0 and 38° by various tissues of different animals indicates the presence of two phosphatases, both active at p_H 9, in varying proportions. Phosphatase-I is inactive in absence of $Mg^{"}$ and is not affected by 10^{-2}M-KCN whilst -II is active in absence of $Mg^{"}$ and is completely inhibited by 10^{-2}M-KCN. The distribution of the two phosphatases in various tissues is indicated. F. O. H.

Alkaline phosphatase. F. Cedrangolo (Enzymologia, 1939, **6**, 72—79).—The alkaline phosphatase of brain is a protein with isoelectric point and max. activity at p_H 8·8—9·0. The enzyme is

adsorbed by kaolin and, to successively greater extents, by $Al(OH)_3$ and $Fe(OH)_3$; adsorption by each reagent is approx. const. over the p_H range of 6·2—9·9 (cf. A., 1939, III, 520). F. O. H.

Determination of alkaline phosphatase in cerebrospinal fluid. H. H. Fleischhacker (Enzymologia, 1939, **6**, 144).—A modification of Bodansky's procedure (A., 1933, 863) is described. Na β-glycerophosphate is used as substrate. C.s.f. retains its phosphatase activity for 24—48 hr. at 0° but at room temp. the activity diminishes after 4 hr. The activity of healthy c.s.f. is 0·1—0·2 Bodansky unit (less if α-glycerophosphate is the substrate). Higher vals. are often obtained in untreated general paralysis of the insane and sometimes in cases of brain tumours. W. McC.

Nicotinamide and cozymase in healthy and vitamin-deficient rats. H. von Euler, F. Schlenk, L. Melzer, and B. Högberg (Z. physiol. Chem., 1939, **258**, 212—218; cf. A., 1939, III, 324).—The nicotinamide and cozymase contents of healthy rats are not affected by administering the amide. In avitaminosis-*B* the contents are low, the vals. being increased to normal levels by administering nicotinamide together with aneurin, lactoflavin, and filtrate complex but not by administering these substances without the amide. The amide is indispensable to the rat and is used in its body for the synthesis of cozymase. W. McC.

(xxv) MICROBIOLOGICAL AND IMMUNOLOGICAL CHEMISTRY.

Oxidation systems in top and bottom yeast. H. von Euler, H. Hellström, and G. Günther (Z. physiol. Chem., 1939, **258**, 47—56).—The average flavin content of a bottom yeast was 20—30 μg. per g. The corresponding vals. for a dry top yeast and another dry bottom yeast were 32·5 and 30 μg. respectively. No relation between intensity of respiration and flavin content has been found. The prep. of diaphorase from yeast is described. Diaphorase does not react with codehydrogenase II but it dehydrogenates dihydrodeaminocozymase. Flavin enzyme oxidises dihydrocozymase and dihydrodeaminocozymase at the same rate. Top yeast consumes more O_2 than does bottom yeast, the difference being very greatly increased if glucose is present. Spectrographic examination of living top and bottom yeast shows that the ratio of the cytochrome-*C* contents in these is 3·45, the corresponding ratio for cytochrome-*A* being approx. 6. The difference in intensity of respiration is probably directly related to the differences expressed by these ratios. Top yeast also contains more cytochrome-*B* than does bottom yeast. W. McC.

Effect of tissue extracts, ammonium salts, and amides on the rate of fermentation by baker's yeast. C. V. Smythe (Enzymologia, 1939, **6**, 9—14).—A testicle extract contained three factors stimulating fermentation by yeast cells; one of these was NH_4Cl which, in amounts of 0·2 mg. per Warburg vessel, increases the rate by 100%. Asparagine and glutamine resemble NH_4Cl in increasing the rate of fermentation but have a smaller effect in reducing the induction period of cell-free extracts of yeast. F. O. H.

Direct fermentation of maltose by yeast. J. Leibowitz and S. Hestrin (Enzymologia, 1939, **6**, 15—26).—Under certain conditions of temp. (4°), p_H (2·5—4·5), and substrate concn., living yeast ferments maltose but not methyl-α-glucoside. The induction period preceding gas evolution in the fermentation of maltose (but not of the glucoside) by dry brewer's yeast preps. is inhibited by hexose diphosphate. Glucose is a sp. activator in the fermentation of maltose by living top yeast. The results indicate that yeast can ferment maltose directly. F. O. H.

Action of baker's yeast on *d*-talose. H. S. Isbell (J. Res. Nat. Bur. Stand., 1939, **22**, 403—405).—Baker's yeast does not acquire the property of fermenting talose by growing on media containing galactose and talose. F. N. W.

Aërobic fermentation; effect of glutathione, cysteine, and hydrogen sulphide. G. W. Kirby, V. Drill, and C. N. Frey (Ind. Eng. Chem., 1939, **31**, 596).—Stimulation of aërobic yeast fermentation of glucose by glutathione and cysteine is due to H_2S liberated from these by the yeast. In presence of either compound, H_2S becomes detectable by smell, and stimulation takes place almost to the level obtained in normal anaërobic fermentation; similar stimulation is obtained in presence of Na_2S. If $Pb(NO_3)_2$ is added to absorb H_2S the degree of stimulation is very much reduced. I. A. P.

Monoiodoacetic acid, glutathione, and glucose fermentation by Lebedev's maceration juice. E. Haag and P. Bolomey (Ann. Ferm., 1935, **5**, 45—56).—A detailed account of work already noted (A., 1939, III, 520). I. A. P.

Preparation of glutathione containing radioactive sulphur. R. G. Franklin (Science, 1939, **89**, 298—300).—*Saccharomyces cerevisiæ*, Frohberg type, is grown on a medium containing the S as radioactive $MgSO_4$, prepared from roll S bombarded by 10-Me.v. deuterons and oxidised to SO_3, H_2O_2, and MgO. After 3 days' growth, the yeast is centrifuged and the radioactive glutathione isolated as the Cu^I salt. L. S. T.

Method for volumetric determination of carbonic acid in alcoholic fermentation. A. P. Weber (Chem. Weekblad, 1939, **36**, 332—335).—A U-tube type of apparatus is described for accurately measuring the evolution of CO_2 from ~20 mg. of sugar at a const. temp. (30°). The solution is maintained in motion and saturated with CO_2. Results with 20 mg. of sugar (5 c.c. of CO_2) are accurate and reproducible to 0·2%, whilst for 4 mg. the accuracy is 1%. S. C.

Yeast-ribonucleic acid.—See A., 1939, II, 346.

Effect of sodium fluoride on formation of citric and gluconic acids by *Aspergillus niger*. S. Lvov and G. M. Toupizina (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 307—311).—NaF in concns. of 1—100 × 10^{-5}M. lowered the sugar consumption and

acid production of *A. niger* in sucrose media. Suppression of citric acid formation was apparent even with the smallest [NaF] and became more marked as the concn. increased, notably in the range 5·0—7·5 × 10^{-5}M. At this concn. production of gluconic acid (which increased slowly with rise in [NaF]) rose sharply. With high [NaF] the yield of glucuronic acid declined. With rise in [NaF] the decrease in citric acid production is associated with continued but declining growth of mycelium, whereas gluconic acid is formed only when disintegration of the mycelium is initiated. A. G. P.

Effect of inorganic phosphates on formation of citric, gluconic, and oxalic acids by *Aspergillus niger*. S. Lvov and E. L. Limberg (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 194—198).—In cultures of *A. niger* inorg. PO_4''' increases sugar consumption and the production of acids, notably citric (in early stages) and oxalic. Yields of gluconic acid were somewhat lowered. AsO_4''' has no supplementary influence on the action of PO_4'''. A. G. P.

Decomposition of amino-acids by *Aspergillus oryzæ*. III. T. Uyemura (J. Agric. Chem. Soc. Japan, 1939, **15**, 353—358).—Addition of *l*-leucine, *l*-glutamic acid, and *l*-tyrosine to media in which *A. oryzæ* is growing leads to the formation of α-keto*iso*hexoic, α-ketoglutaric, and *p*-hydroxyphenylpyruvic acid (2 : 4-*dinitrophenylhydrazone*, m.p. 198°) respectively. J. N. A.

Moulds which grow in high concentration of sulphuric acid and cupric sulphate. T. Sato (J. Agric. Chem. Soc. Japan, 1939, **15**, 359—369).—The morphology and cultural characteristics of four strains of moulds isolated from H_2SO_4–$CuSO_4$ solutions and Bertrand's reagent are described. *Oospora viscosa* nov. sp. has restricted growth on any media except koji and malt extract agar. The optimum temp. is 28°, with inhibition below 14° and above 37°. The optimum p_H is 5·4. The mould grows vegetatively in 0·05% $CuSO_4$, 7% H_2SO_4, 2·5% HCl, and 2% HNO_3. *Dematium pullulans*, de Bary, var. *acidiphylum* nov. var., grows well on koji and malt extract agar. The optimum temp. and p_H are 30° and 5·4 respectively. It grows vegetatively in 0·1% $CuSO_4$, 5% H_2SO_4, and 1% HCl. *Penicillium cuprophyllum*, nov. sp., has optimum temp. 28° with inhibition below 0° and above 37°. The optimum p_H is 7·6 or 4·4. It grows vegetatively but does not spore in 19% $CuSO_4$. *Pencillium biforme*, Thom, var. *vitriolum*, nov. var., has the same optimum conditions as *P. cuprophyllum*, and it grows but does not spore in 21% $CuSO_4$. Carbohydrates are not fermented by any of the moulds. J. N. A.

Rôle of fungi and actinomycetes in the decomposition of cellulose. F. Baker (Nature, 1939, **143**, 522—523).—Photomicrographs showing the decomp. of the cellulose in animal fæces, composts, and dunghills are reproduced and described. L. S. T.

Activity of actinomycetes on cellulose. E. Baldacci and O. Verona (Boll. Soc. ital. Biol. sperim., 1939, **14**, 155—156).—Strains of *A. albus*, *A. griseus*, and *A. violaceus* (from intestine of termites) and *A. cellulosæ* had no apparent effect when cultured in presence of cellulose. F. O. H.

Homogeneous cultures of actinomyces; new serological phenomenon. S. Hassegawa and M. Kochi (Jap. J. exp. Med., 1939, **17**, 185—195, 197—209).—By the use of convallamarin, homogeneous cultures of actinomyces could be obtained. These cultures showed clarification on the addition of serum. C. J. C. B.

Isolation of the active principle in *Claviceps paspali*. M. Geiger and B. F. Barrentine (J. Amer. Chem. Soc., 1939, **61**, 966—967).—The active principle does not give the test for ergot alkaloids and is probably not glucosidic. R. S. C.

Nutritive spheres in *Amœba proteus*, Y. M. Taylor (Nature, 1939, **143**, 685).—A method of demonstrating the presence of glycogen in and of making permanent preps. of this amœba is described. L. S. T.

Effect of sodium, potassium, and calcium ions on changes in volume of *Amœba proteus*. S. O. Mast and C. Fowler (Biol. Bull. Woods Hole, 1938, **74**, 297—305).—All 3 cations decrease the permeability to water of the surface of amœbæ. The order of effectiveness is Ca > K > Na. A. D. H.

Electrodialytic "washing" of *Paramecium*. H. Kinosita (Proc. Imp. Acad. Tokyo, 1939, **15**, 90—93).—*P. caudatum* withstands prolonged washing with distilled water buffered at p_H 7·2—7·3 by 0·00025N-$NaHCO_3$ but is slowly killed when an electric current is passed through the washing solution. The presence of KCl (up to 0·01M.) or $CaCl_2$ (0·006M.) accelerates the disintegration of *Paramecia* by the current, but when both salts are present they appear to inhibit the effect of each other. The c.d. and the rate of flow of the washing solution affect the rate of disintegration. The current, especially in presence of salts, promotes the removal of essential compounds from the body of the *Paramecium*. W. O. K.

Effect of temperature on a mixed culture of two organisms in symbiotic relation. E. H. Richards (J. Agric. Sci., 1939, **29**, 302—305).—Fixation of N by pure cultures of *Azotobacter chroococcum* on glucose media and in mixed culture with coliform organisms on media having starch as sole carbohydrate is examined. Under the latter conditions two temp. of max. fixation are established. A. G. P.

Carbon dioxide utilisation during dissimilation of glycerol by propionic acid bacteria. A. S. Phelps, M. J. Johnson, and W. H. Peterson (Biochem. J., 1939, **33**, 726—728).—The utilisation of CO_2 by these bacteria has been confirmed. P. G. M.

Effect of thiol group on fermentation and respiration of propionic bacteria in presence of glucose. Suppression of the Pasteur effect. P. Chaix and C. Fromageot (Enzymologia, 1939, **6**, 33—45).—The utilisation of glucose by *Propionibacterium pentosaceum* and *P. zeæ* is greater aërobically than anaërobically; the Pasteur effect is evident. Cysteine (10^{-5}M.) slightly increases anaërobic fermentation and, to increasingly greater extents,

oxidation and aërobic fermentation of glucose; aërobic becomes equal to, or slightly greater than, anaërobic metabolism and the Pasteur effect is thus suppressed. H_2S has a similar action. Prolonged washing of *P. pentosaceum* lowers the rate of anaërobic fermentation, which, however, is increased by addition of cysteine to an extent greater than that occurring with unwashed bacteria. The protective action of thiol groups against the oxidative inhibition of conversion of glucose into C_3 compounds is discussed. F. O. H.

Synthetic and independent fermentations. I. Propionic fermentation of pyruvic acid. C. Fromageot and R. Safavi (Enzymologia, 1939, **6**, 57—63).—Data indicating the relative extents of the conversion of pyruvic acid into propionic acid + acetic acid + CO_2 (with lactic acid as an intermediary) and the anaërobic degradation of pyruvic acid into acetic acid + lactic acid + CO_2 by anaërobic cultures of *Propionibacterium pentosaceum* are discussed. F. O. H.

Biochemical study of wines affected by *Eudemis*. J. Ventre (Ann. Ferm., 1939, **5**, 13—44).—When grapes attacked by larvæ of *Eudemis* are put into samples of sterile must, there is often no alcoholic fermentation, but a thick surface film is produced. The organism responsible resembles the sorbose bacterium in that it produces dihydroxyacetone, fructose, and sorbose from glycerol, mannitol, and sorbitol respectively, but differs from this in its action on glucose and fructose. At 10—12°, much fixed acid is produced from glucose and fructose, especially from the former; at 28°, there is considerable production of volatile acid. Gluconic and glycuronic acids are produced from must or artificial media containing glucose. I. A. P.

Isolation of schizomycetes (*Cytophaga*) from the intestine of termites. E. Baldacci and O. Verona (Boll. Soc. ital. Biol. sperim., 1939, **14**, 156).—Cellulose-utilising schizomycetes were isolated. F. O. H.

Sugar fermentation of cellulose by thermophilic bacteria. A. Imshenetzki (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 332—334).—The fermentation of cellulose to sugar by anaërobic bacteria is described. The sugar produced is proportional to the cellulose decomposed. The organism requires complex org. N in the medium and utilises very little sugar. H. G. R.

***l*-Ascorbic acid and anaërobes.** F. Patocka and J. Ilavsky (Ann. Inst. Pasteur, 1939, **62**, 296—316).—*l*-Ascorbic acid is as effective as cysteine in producing growth of anaërobic bacteria under aërobic conditions. The fall in E_h was the same as that produced by cysteine, but was more prolonged. Ascorbic acid is inferior to glucose in the production of toxin, but when added with glucose, toxin production is greatly increased. G. P. G.

Effect of blood treated by heat, acid, or alkali on growth of *C. diphtheriæ*. V. Glass (J. Path. Bact., 1939, **48**, 507—518).—Solutions of blood cells coagulated by heat, acid, or alkali inhibited the growth of half the *mitis* strains of *C. diphtheriæ* tested. The inhibitory property develops in parallel with the process of coagulation and, once this is complete, does not increase on further heating. The finer is the coagulum the greater is the inhibition; very finely dispersed coagula inhibit in concns. equiv. to 1% of whole blood. The inhibitory effect is removed by anaërobic incubation or by addition of $Na_2S_2O_4$, but the coagulum itself did not exert an oxidising action, judged by the methylene-blue technique. KCN does not annul the inhibitory property but may prevent its development by interfering with coagulation. The survival, as distinct from the growth, of sensitive organisms on heated blood agar varies with the temp. of incubation. Resistant variants may be derived from sensitive cultures by subculturing the few colonies which develop. C. J. C. B.

Antitoxic immunity produced by intravenous injection of diphtheria toxoid and tetanus toxin into hens. I. Watanabe (Jap. J. exp. Med., 1939, **17**, 127—137).—Intravenous injection of purified diphtheria toxoid into hens caused rapid production of antitoxin, which reached a high level, and was obvious by the 7th day. With tetanus toxin the production of antitoxin was only slightly more speedy than after subcutaneous injection. The duration of antitoxin retention in the blood was in each case much longer with the intravenous method. C. J. C. B.

Flavin content of diphtheria toxin broth. C. Dhéré and A. Gourévitch (Compt. rend. Soc. Biol., 1939, **130**, 593—595).—Appreciable quantities (1·1—3·6 μg. per c.c.) of flavin occurred in filtered diphtheria toxin broth. H. G. R.

Bactericidal activity of sterilised and non-sterilised Korean condiments against dysentery bacilli. Y. L. Pak (J. Agric. Chem. Soc. Japan, 1939, **15**, 331—336).—Twenty condiments were tested for bactericidal activity against dysentery bacilli—Shiga, and Komagome-*A* and -*B*. In general non-sterilised have greater bactericidal activity than sterilised condiments. Black pepper, mustard, and vinegar have the greatest activity, whilst honey, sesamé oil, and rock mushroom, which are considered to be less bactericidal, are almost equal in their activities. The least bactericidal are miso (soya bean paste), mushroom, radish, and hot pepper. Komagome-*A* strain is less resistant to sterilised and non-sterilised condiments, whilst Shiga and Komagome-*B* are about equally resistant. Sterilised condiments have a greater p_H, and when sourness and peppery taste are decreased bactericidal activity is also decreased. The activity is due to chemical constituents and p_H. J. N. A.

***Hæmophilus influenzæ*. II. Two serologically active protein fractions isolated from Pfeiffer's bacillus.** A. E. Platt (Austral. J. Exp. Biol., 1939, **17**, 19—24).—Two serologically active protein fractions, designated "*M*" and "*P*," were recovered from strains of *H. influenzæ*. Fraction *M* reacted with antisera prepared against most strains and seemed to be identical with the antigenic component common to all strains of *H. influenzæ* and at least one strain of *H. canis*. This fraction is very labile. Fraction *P* possesses a high degree of immunological specificity. D. M. N.

Gold sol test for bovine mastitis. R. Aschaffenburg (Nature, 1939, **143**, 523—524).—5 ml. of Lange's red Au sol mixed with 1 ml. of casein-free milk serum of p_H 6·0—6·5 remain unchanged by sera from the milk of healthy cows, but change to blue or violet even with slight infection of the udder. L. S. T.

Viability and maintenance of oral strains of *Lactobacillus acidophilus*. H. R. Sullivan (J. Path. Bact., 1939, **48**, 607—609).—12 oral strains of *Lactobacilli* were maintained without subculture for at least 3 months in cooked meat media at 8°, 22°, or 37°. C. J. C. B.

Experimental proliferative arthritis in mice produced by filtrable, pleuropneumonia-like micro-organisms. A. B. Sabin (Science, 1939, **89**, 228—229).—A progressive, proliferative polyarthritis bearing a clinical and pathological resemblance to human rheumatoid arthritis was produced experimentally in mice with a filterable, pleuro-pneumonia-like micro-organism isolated from the brain of a normal mouse. The pathological changes in mice are described. W. F. F.

Effect of colchicine on the development of *Photobacterium phosphoreum*. F. Obaton (Compt. rend., 1939, **208**, 1536—1538).—0·05% of colchicine accelerates the growth and the appearance of phosphorescence in cultures of the bacteria but the luminosity is lost more rapidly than in the absence of colchicine. J. L. D.

Influence of inflammation on skin-necrotising action of staphylococcus toxin. H. B. Kenton (Amer. J. Path., 1939, **15**, 185—192).—In rabbits, local cutaneous areas were passively sensitised by the intradermal infiltration of immune serum. A few hr. later, toxin was injected into the infiltrated site and an allergic inflammation was induced by the intravenous administration of the homologous antigen. The effect of the toxin was markedly inhibited by the inflammatory reaction; the necrotic areas were smaller, less severe, and healed more quickly than controls. (4 photographs.) C. J. C. B.

Staphylococcal infection in rabbits: antibacterial and non-specific immunity. S. T. Cowan (J. Path. Bact., 1939, **48**, 545—555).—Rabbits immunised by intravenous injection of staphylococcal vaccine developed some resistance to intravenous infection with the same organism. A similar degree of resistance was produced by intravenous inoculation of a vaccine made from an antigenically unrelated bacterium. C. J. C. B.

Immunising value of anatoxins derived from toxins grown on synthetic medium. R. Richou and M. Djourichitch (Compt. rend. Soc. Biol., 1939, **130**, 607—608).—The toxoids derived from staphylococcus toxins grown on a synthetic medium are as efficacious as those from toxins grown on the usual media. P. C. W.

Production of diacetyl by fæcal streptococci. J. G. Davis, H. J. Rogers, and C. C. Thiel (Nature, 1939, **143**, 558).—Only the fæcal streptococci, *Str. fæcalis* and *Str. liquefaciens*, produce considerable amounts of diacetyl from glucose, or milk and yeast milk in resting and in growing conditions. Diacetyl is produced only in presence of O_2. This result is discussed in relation to the production of flavour in milk products. L. S. T.

Suitability of "liquoid" in blood culture media, with reference to anaërobic streptococci. E. D. Hoare (J. Path. Bact., 1939, **48**, 573—577).—Liquoid, like trypsin, abolishes the bactericidal power of normal blood and does not interfere with the cultivation of most common pathogenic organisms. Its presence, however, was unfavourable to the growth of anaërobic streptococci (5 strains); liquoid is thus not suitable for routine use. Sterile trypsin has no such inhibitory effect. C. J. C. B.

Bacteriology of the urinary tract. T. L. Schulte (Proc. Staff Mayo Clin., 1939, **14**, 249—254).—The normal human urinary flora, in order of frequency, is: *Micrococcus*, diphtheroids, *Streptococcus fæcalis*, *α-Streptococcus*, *γ-Streptococcus*, *Staphylococcus albus*, *Escherichia coli*, *Aërobacter aërogenes*, and *Pseudomonas*; and of the prostatic secretion, *α-Streptococcus*. Methods are described of determining the urea-splitting property of urinary bacteria and the pathogenicity and classification of Gram-positive urinary cocci. A. M. G.

Preparation of an antigen for use in complement fixation test for syphilis. F. Boerner, C. A. Jones, and M. Lukens (Amer. J. clin. Path., 1939, **9**, 321—328). C. J. C. B.

Relations between antigenic factors of the *Salmonella* group. K. Meyer (Ann. Inst. Pasteur, 1939, **62**, 282—295; cf. A., 1938, III, 1059).—The complete somatic antigenic complex was extracted from *Salmonella* organisms and pptd. with sera sp. for one only of the antigenic factors which it contained. The ppt. was dissociated, redissolved, and titrated against monosp. sera for each antigen present in the complex. In all cases the titre was the same as that obtained with the whole complex. The titre of monosp. sera for each factor of the complex was the same for all strains of the same species. Quant. relations between the various antigenic factors are the same for all strains of the same species. The different factors are chemically united in the complex, but this gives rise to a multiplicity of antibodies each of which is able to ppt. the whole complex. G. P. G.

Effect on bacteria of continued cultivation in lecithin broth. B. S. Levin and L. Olitzki (Nature, 1939, **143**, 604—605).—The pathogenic properties of bacteria (*typhi*, *dysenteriæ*, *coli*) are slowly reduced by daily subcultures (about 100) on bouillon containing 0·2—4% of colloidal lecithin. W. F. F.

Effect of inflammatory exudates on course of experimental tuberculosis. W. H. Hughes (J. Path. Bact., 1939, **48**, 605—607).—A substance is present in inflammatory exudates which, when injected into animals together with tubercle bacilli, accelerates death from tuberculosis. The morbid anatomy and histology of the lesions and the no. of bacilli present confirm the fact that the disease is rendered more acute in type. (6 photomicrographs.) C. J. C. B.

Respiration of tubercle bacilli. T. Nakamura (Tohoku J. exp. Med., 1938, **34**, 231—245).—Mainly the human type was studied by Warburg's method. Addition of carbohydrates, amino-acids, or Na salts of org. acids had no influence. Glycerol and especially traces of Fe increase respiration. F. Ja.

Complement-fixation test in tuberculosis. Agglutination in tuberculosis. S. Hassegawa and M. Kochi (Jap. J. exp. Med., 1939, **17**, 163—173, 175—183).—Homogeneous emulsions of non-acid-fast tubercle bacilli were used with success in the complement-fixation test for tuberculosis, and in an agglutination test. C. J. C. B.

Sero-diagnosis of tuberculosis. G. D'Alessandro (Klin. Woch., 1939, **18**, 493—496).—The method consists of the elution of the antibody from a complex produced by its adsorption from the serum on to a kaolin–antigen adsorbent. Only true immunity reactions then take place which are quantitatively equal to those obtained in the original serum. E. M. J.

Fixation of bacteriophages and lysogenic cultures. I. Lominski (Compt. rend. Soc. Biol., 1939, **130**, 602—605).—Two variants of the phage, having the same antigenic characters and heat-resistance, can be detected by differential fixation, the symbiotic variant fixing the lysogenic strain and the original variant not possessing this power. H. G. R.

Virus investigations. W. Koschara (Chem.-Ztg., 1939, **63**, 313—316).—Methods of isolation and the nature of virus proteins are discussed. A. G. P.

Ectromelia produced in mice by inoculation of human blood. G. Hornus and P. Thibault (Compt. rend. Soc. Biol., 1939, **130**, 640—641).—Intraperitoneal injection of blood from a patient with a febrile condition of unknown origin into mice produced symptoms of ectromelia. An active virus strain was present in bacteriologically sterile emulsions of the liver of the treated mice. P. C. W.

Cultivation *in vitro* of the virus of Japanese encephalitis. Y. Kawakita (Jap. J. exp. Med., 1939, **17**, 211—225).—4 strains of the virus of Japanese encephalitis were successfully cultivated *in vitro* on a medium of minced chick embryo brain suspended in the allantoic fluid of a developing hen's egg. For detecting min. quantities of the virus, cultivation is at least as sensitive as direct intracerebral inoculation of mice. C. J. C. B.

Human toxoplasmosis: occurrence in infants as an encephalomyelitis; verification by transmission to animals. A. Wolf, D. Cowen, and B. Paige (Science, 1939, **89**, 226—227).—Toxoplasmosis has been demonstrated in man and occurs as a disease of young infants involving the central nervous system. The experimental transmission to animals (rabbit, mouse, guinea-pig, chick) is described. In man the symptoms of the disease are: convulsive seizures, respiratory disturbances, and spinal cord involvement, and terminally irregular reddish-brown areas in each macular region. The pathology is described also. W. F. F.

Treatment of early measles with parental whole blood. J. L. Kohn, A. E. Fischer, and H. U. Resch (J. Pediat., 1939, **14**, 502—505).—66 children under 3 years of age were injected subcutaneously with 20—40 c.c. of adult blood during the pre-eruptive or early eruptive stages of measles. There was little difference in the severity of the measles or the incidence of pulmonary involvement compared with a control group of 758 children of the same age group. C. J. C. B.

Immunisation to infectious myxomatosis. R. R. Hyde (Science, 1939, **89**, 205).—Some resistance to infection by myxoma virus is conferred in rabbits by intradermal injections of heat-inactivated tissue virus (60° for 30 min.). This may be enhanced by the addition of the viable type, type III *Pneumococcus* or *Bacterium lepisepticum*. W. F. F.

Infectious polyarthritis of rats. W. A. Collier (J. Path. Bact., 1939, **48**, 579—589).—In *Rattus norvegicus* a spontaneous arthritis was observed which was readily transmitted to white rats and field rats (*R. brevicaudatus*) on plantar, subcutaneous, intraperitoneal, intrapleural, and intracerebral injection. The disease may be fatal or the rat may recover, or the joint swelling may persist. No organism could be cultivated, but bacteriologically sterile material produced infection on injection. The agent was found in the joints, blood, brain, lungs, pleural exudate, spleen, and peritoneal exudate, and in animals in which no symptoms followed infection. Once the disease has been overcome there is immunity to reinfection. Animals in which symptoms in the joints have not disappeared generally prove immune to a second injection, as do those which showed no signs of the disease after the first injection. No complement-fixing, pptg., or neutralising antibodies were discovered in the serum of the immune rats. C. J. C. B.

Infection of chicks and chick embryos with rabies. J. R. Dawson (Science, 1939, **89**, 300—301).—The chick embryo brain is a satisfactory medium for the propagation of the rabies virus. W. F. F.

Ultravirus and fluorescence. C. Levaditi (Compt. rend. Soc. Biol., 1939, **130**, 605—607).—Thioflavine S is the most satisfactory dye for examination of ultraviruses with the fluorescence microscope. H. G. R.

Adsorption of the virus of the infectious anæmia of Equidæ on aluminium hydroxide. L. A. Martin (Compt. rend., 1939, **208**, 677—679).—Freshly pptd. $Al(OH)_3$ adsorbs the virus from the buffered, dil. serum. An emulsion of the adsorbate injected subcutaneously into a donkey indicates that the pathogenic character of the virus persists. J. L. D.

Adsorption of sheep-pox virus and action of its antiserum. N. Stamatin (Ann. Inst. Pasteur, 1939, **62**, 447—462; cf. A., 1937, III, 228).—The virus of sheep-pox is almost completely adsorbed by animal charcoal at p_H 6·5. Adsorption is less marked at p_H 7·5. Kaolin is a poor adsorbent. By adding animal charcoal to an inactive mixture of virus and

its antiserum and centrifuging, the virus can be recovered in an active form capable of producing sp. lesions. Such virus is less virulent than one not previously exposed to antiserum. G. P. G.

Action of bile salts on viruses. W. Smith (J. Path. Bact., 1939, **48**, 557—571).—Certain bile salts can inactivate some viruses but have no effect on others. The inactivation is almost instantaneous and may depend on lysis of virus elements. Na deoxycholate and Na apocholate are most active, the former being 4 times as active as the latter. Na cholate is only slightly active. The susceptibility of a virus is not related to its size. Bile salt lysis can be observed both macroscopically and microscopically with the cultivable virus-like organism of pleuropneumonia and the sewage organisms of Laidlaw and Elford. Attempts to use lysed virus preps. for prophylactic immunsation were not encouraging. C. J. C. B.

(A) Tobacco mosaic virus as influenced by micro-organisms. (B) Absorption of virus by micro-organisms. M. I. Goldin (Compt. rend. Acad. Sci. U.R.S.S., 1938, **20**, 735—739, 739—740).—(A) Loss of activity of virus juice (whether sterilised or not) is more rapid under aërobic than under anaërobic conditions. Activity is not in all cases diminished by growth of bacteria (*e.g.*, *B. mycoides*).

(B) In acid media, *B. mycoides* and other organisms selectively absorb the virus. A. G. P.

Preserving effect of some reducing systems on the virus of tomato spotted wilt. R. J. Best (Austral. J. Exp. Biol., 1939, **17**, 1—17).—In presence of platinised Pt H_2 arrested the normal aërobic inactivation of the virus and maintained the activity at const. level. Suspensions of the virus in presence of cysteine and absence of O_2 were kept active for 35 days as compared with the normal life *in vitro* of a few hr. The Na salts of glutathione, thioglycollic and ascorbic acids at p_H 7 preserved the virus against rapid aërobic inactivation. Adrenaline had no significant effect in air, but protected the virus against the slow inactivation which occurs anaërobically. Redox potentials of the systems are recorded and discussed in relation to the efficiency of the protective agents. D. M. N.

Disintegration of tobacco mosaic virus in urea solutions. W. M. Stanley and M. A. Lauffer (Science, 1939, **89**, 345—347).—The virus is rapidly disintegrated in 6M-urea and 0·1M-PO_4''' buffer at p_H 7, with liberation of SH groups, into protein components of low mol. wt. These contain no nucleic acid, exhibit no double refraction of flow, are insol. in dil. buffers, and possess no virus activity (cf. A., 1939, III, 530). The rate of degradation varies widely with the concn. of urea, the concn. and type of electrolyte, [H·], and temp. L. S. T.

Quantitative investigation of streaming double refraction of tobacco mosaic and potato-*X* viruses. G. A. Kausche, H. Guggisberg, and A. Wissler (Naturwiss., 1939, **27**, 303—304).—The variation of the extinction angle of a solution of tobacco mosaic virus with the streaming gradient was determined and compared with that of aq. colloidal methylcellulose (mol. wt. 38,100) and of Na thymonucleate (mol. wt. approx. 7×10^6). The comparison indicates that individual particles of the virus have a mol. wt. of several millions. The extent of positive double refraction of the virus solution obeys the laws of ideal dil. solutions. For each streaming gradient the optical anisotropy is proportional to concn. of tobacco mosaic virus over the range 0·0004—0·002 g. per c.c. The curve of extinction angle is unaffected by concn. There is probably no dissociation or variation in form of the virus particles on dilution of the solution. The determination of double refraction can be used to ascertain the concn. of virus solutions even when very dil. Solutions of the potato-*X* virus show essentially the same double refraction properties as the tobacco mosaic virus, but the orientation of particles of the latter is always the more complete. A. J. M.

Making plant viruses visible with the supermicroscope. G. A. Kausche, E. Pfankuch, and H. Ruska (Naturwiss., 1939, **27**, 292—299).—Images of the tobacco mosaic and the potato-*X* viruses are obtained with the electron microscope. An aq. solution of the virus is placed on a collodion or shellac film and allowed to dry. If the solution is sufficiently dil. the individual rods or threads dry apart from each other. The dimensions of the viruses obtained from the smallest visible particles agree with those obtained by *X*-ray and ultra-centrifuge methods. The virus mol. probably has dimensions 300 or 150×15 mμ. Linear and lateral aggregation occurs. When those particles with the smallest dimensions are further broken down by chemical action, the products are not pathologically active. A. J. M.

Chemical study of bacterial toxins. T. Wagner-Jauregg (Angew. Chem., 1939, **52**, 389—392).—A review.

Determination of hydrogen peroxide in bacterial cultures. E. R. Main and L. E. Shinn (J. Biol. Chem., 1939, **128**, 417—423).—H_2O_2 in bacterial cultures is determined by oxidation of *o*-tolidine in the presence of a peroxidase extract, the colour developed being compared with standards. The error is less than 15% for concns. of 6—30 μg. of H_2O_2 per c.c. E. M. W.

Use of various chemicals in bacteriology. S. Hassegawa and T. Nakamoto (Jap. J. exp. Med., 1939, **17**, 139—149).—Na deoxycholate is very active in dissolving the cholera vibrio. *Spirochæta pallida* and *dentium* but not *icterohæmorrhagia* and *recurrens* are dissolved by convallamarin, digitalis, and digitonin. C. J. C. B.

Nile-blue culture medium for lipolytic micro-organisms. G. M. Eisenberg (Stain Tech., 1939, **14**, 63—67).—Full details are given of a method of preparing an agar culture medium containing Nile blue sulphate in cottonseed oil and gelatin. After inoculation, the originally pink medium is turned blue by organisms that decompose fats, while non-lipolytic colonies appear pink or white. E. E. H.

New blood culture media apparatus. P. Narvaez (J. Lab. clin. Med., 1939, **24**, 849—850). C. J. C. B.

Microbiology of coal. F. W. Fuchs (Science, 1939, **89**, 389—390).—Solutions prepared from the alkali-sol. humic acids resulting from the oxidation of bituminous coal form good substrates for cultivating bacteria, fungi, and actinomyces. Practically all carbonaceous material is consumed. The breakdown of the coal substance yields non-volatile acids. L. S. T.

(xxvi) PLANT PHYSIOLOGY.

Variations in cellular functions [of plants and animals] according to the composition of nutrient medium. II. P. Mazé [with P. J. Mazé, jun., and R. Anxionnaz] (Ann. Inst. Pasteur, 1939, **62**, 317—360; cf. A., 1939, III, 634).—The amount and nature (whether $NH_4^{\cdot}$ or NO_3') of the N assimilated by plants depend on the composition and concn. of the medium on which they have grown and are associated with differences in composition of the protoplasm. The intake of mineral matter and subsequent exchanges in plant tissues are ionic reactions. In milk-fed animals the influence of I and F on food utilisation, growth, and fecundity is dependent on the nature of the diet. G. P. G.

Increase in permeability of protoplasm in wilting plants. N. A. Maximov (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 183—186).—Slight wilting causes an increase in permeability of cells to electrolytes; recovery to normal condition on moistening of leaves is rapid. With more severe wilting the permeability is more markedly affected and recovery is very slow. A. G. P.

Intake of ions by carrot tissue at different hydrogen-ion concentrations. A. H. K. Petrie (New Phytol., 1938, **37**, 211—231).—The relation of cation intake of the tissue to p_H of external liquid shows a drift with time but conforms more nearly to that of a Donnan system soon after immersion and again after 2 days. The p_H–anion intake curve agrees generally with that of a Donnan relationship but other factors are probably concerned. A. G. P.

Root studies. VII. Survey of literature on root growth with special reference to hardy fruit plants. W. S. Rogers (J. Pomology, 1939, **17**, 67—84).—The influence of soil conditions and other factors on root development is considered. A. G. P.

Effect of alpine climate on plant metabolism. R. Combes and M. T. Gertrude (Compt. rend., 1939, **208**, 661—664).—*Veronica anagallis* (grows on the plains), *Taraxacum dens leonis* (plains or alpine), and *Erysimum helveticum* (alpine) were grown in identical soil (*a*) in the laboratory, (*b*) under alpine conditions, and (*c*) with low night temp. and high day temp. (artificial alpine conditions). Those plants grown under alpine or "artificial" alpine conditions showed alpine characteristics of form and development and contained more sol. carbohydrate, phospholipins, and sterols, but less fatty acids, than those grown on the plains. J. L. D.

Quantitative variations in fatty acids, sterols, and phospholipins during the maturation of the fruit of the ivy. R. Ulrich (Compt. rend., 1939, **208**, 664—666).—The sterol and fatty acid contents increase [*e.g.*, 0·110—0·247% and 3·33—26·41% (dry wt.)] as the fruit matures. The phospholipin content at first increases and then decreases due partly to the formation of seeds (cf. A., 1938, III, 633) and partly to the fact that phospholipins are formed in the pericarp less rapidly than is P-free material. J. L. D.

Biochemical possibilities of a plant species. R. Combes and M. T. Gertrude (Compt. rend., 1939, **208**, 1107—1109; cf. A., 1937, III, 106).—Batches of *Veronica anagallis* were grown under identical conditions except for lighting which ranged from full to 1/6 sunlight. The less was the light the greater was the ash, total carbohydrate, and protein content of the plants. The range of variation in the same constituents was much greater between plants grown at a high altitude and those immersed in water. J. L. D.

Age and daily variations in citric acid content of leaves of *Nicotiana rustica*. A. V. Vladimirov and G. V. Liaskovskaja (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 44—46).—The % of citric acid in the dry matter of leaves increased with age but was consistently higher at night than in daytime. The differences were maintained in leaves killed with ether, artificially dried, or stored as in commercial practice. A. G. P.

Transitory accumulation of carbohydrates in leaves of *Vicia faba* in direct sunlight and in shade. A. Iuraceo (Bull. Acad. Sci. Roumaine, 1939, **21**, 20—29).—Leaves developing in direct sunlight as opposed to those in shade contain 1·3 times the total amounts of chlorophyll and reducing sugars, more total carbohydrates per unit fresh wt., but less reducing sugar per unit dry matter. A. G. P.

Seasonal cycles of ash, carbohydrate, and nitrogenous constituents in terminal shoots of apple trees: effects of five vegetatively propagated rootstocks. III. Nitrogenous constituents. J. E. Kench (J. Pomology, 1939, **16**, 346—363; cf. A., 1939, III, 211).—Only one of the 5 rootstocks M.IX induced significant differences in the N constituents of the wood of the scion, viz., a high total N content and a tendency to accumulate amide-N. The stocks produced pomological differences in the scion which were unrelated to the N content of terminal shoots. The relative proportions of N constituents in root and bark were similar on all stocks except M.IX. Seasonal cycles of individual N fractions differed from each other, notably the total, protein-, and total non-protein-N. Seasonal cycles in bark differ from those in wood. Data for Lane's Prince Albert trees show a general similarity to those for Newton Wonder previously recorded. A. G. P.

Relation between nitrogen compounds of crop seeds and diastatic power of their malts. IV. Barley and naked barley. H. Katagiri and N. Mugibayasi (J. Agric. Chem. Soc. Japan, 1939, **15**, 309—316; cf. A., 1939, III, 199).—During germination of seeds of 23 species of barley and 7 of naked barley, hordein- or glutelin-N decreases whilst sol. N

always increases, although the rates vary from species to species. The activity of maltase in germinated seeds is different for each species. The saccharifying power of the germinated seeds can be determined from the amount of albumin-N in the ungerminated seeds. J. N. A.

Dynamics of carbohydrate accumulation in plant leaves as influenced by the carbon dioxide content of air. L. M. Dorochov (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 72—76).—Increase in [CO_2] in the atm. of glasshouses accelerated photosynthesis and storage of carbohydrate but also increased the respiratory loss of carbohydrate. The former effect predominated. A. G. P.

Effect of carbon dioxide on transpiration and stomatal apparatus in plants. L. M. Dorochov (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 77—80).—High [CO_2] lowered the transpiration rates of cucumber and tomato plants under glass. Stomatal opening was diminished although the rate of diffusion of water vapour from intracellular spaces per unit area of opened stomata increased. A. G. P.

Respiratory metabolism of carrot tissue. I. Material and methods. II. Effect of sodium iodoacetate on respiration and fermentation. J. S. Turner (New Phytol., 1938, **37**, 232—253, 289—311).—II. Fermentation of carrot tissue in N_2 is inhibited by dil. aq. Na iodoacetate. Certain concns. of the salt have in specified times less effect on respiration than on fermentation. Efficiency of iodoacetate in inhibiting glycolysis in the living tissue is diminished by presence of O_2 and may be suspended entirely in pure O_2. The mechanism of the processes of fermentation and respiration is discussed. A. G. P.

Plant respiration. V. Respiration of some storage organs in different oxygen concentrations. J. K. Choudhury (Proc. Roy. Soc., 1939, **B**, **127**, 238—257).—In the potato, the respiratory activity is independent of [O_2] in the range 6·2—98·6%; in the artichoke, respiratory rate varied with [O_2] below 20%; in the carrot, respiratory range followed [O_2] at all levels. In N_2 the respiratory rate of potato, artichoke, and red beetroot is diminished; in the carrot the anaërobic rate gradually rises and may be maintained at a high level for 100 hr. It is concluded that O_2 is not essential for the production of respiratory sugar. F. B. P.

Inhibition of respiration and photosynthesis in *Chlorella pyrenoidosa* by organic compounds that inhibit copper catalysis. L. F. Green, J. F. McCarthy, and C. G. King (J. Biol. Chem., 1939, **128**, 447—453).—Thiourea and salicylaldoxime reversibly inhibit photosynthesis and, to a smaller extent, respiration in *C. pyrenoidosa*. Other Cu "poisons" inhibit photosynthesis but solubility or decomp. products interfere with their effect on respiration. E. M. W.

Oxygen produced by isolated chloroplasts. R. Hill (Proc. Roy. Soc., 1939, **B**, **127**, 192—210).—Cell-free suspensions of chloroplasts from leaves of *Lamium album* or *Stellaria media* suspended in solutions of sucrose evolve O_2 in light in presence of leaf extracts or Fe^{III} salts. They do not produce O_2 from CO_2. O_2 production and disappearance was measured spectrographically using hæmoglobin. The activity of isolated chloroplast per unit of chlorophyll is about 1/10 that of the leaf under optimum conditions. F. B. P.

Stomatal index and transpiration rate of leaves. H. B. Smith (Science, 1939, **89**, 268—269).—In the young bean, transpiration rate is associated with stomatal index, but not with stomatal no. L. S. T.

Supposed reducing action of chondriosomes towards Janus-green. A. Guilliermond and R. Gautheret (Compt. rend., 1939, **208**, 1061—1065).—The chondriosomes and plastids of the epidermal cells of *Allium cepa* immersed in a dil. solution of Janus-green are at first stained pale green, the vacuoles scarcely, and the nucleus and cytoplasm not at all. Then the chondriosomes become more strongly coloured and later the dye is rapidly reduced to a rose-coloured substance (chondriosomes coloured violet), which accumulates in the vacuoles, cytoplasm, and nucleus, which show a greater affinity for the reduction product than do the chondriosomes. The final distribution of the reduced dye differs in different cells. *Oidium lactis* gives similar results; the lipoid granules have a marked affinity for the reduced dye. J. L. D.

Significance of potassium in chlorophyll production in plants. G. Rohde (Z. Pflanzenkr. Pflanzenschutz, 1935, **45**, 499—510).—Translocation of Fe in plants is facilitated by K. Deficiency of K results in accumulation of Fe in stem nodes, restricts carotene production, and leads to production of blue anthocyanin pigment. In the process of chlorophyll production an antagonism exists between the nutrients K and Fe and between N and Mn. A. G. P.

Content, requirement, and process of assimilation of copper of oat varieties as a basis for breeding varieties resistant to "moorland heath" disease. B. Rademacher (Z. Pflanzenkr. Pflanzenschutz, 1937, **47**, 545—560).—The difference between the Cu contents of grain and straw in resistant varieties of oats on these Cu-deficient soils exceeds that in susceptible varieties. On normal soils susceptible and resistant varieties show similar Cu contents. Resistance is related to the ability of the roots to assimilate Cu from soil and is paralleled by drought-resistance. A. G. P.

Physiological rôle of indispensable "trace" elements for plants. A. P. Schtscherbakov (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 189—193).—Addition of trace elements (B, I, F, Mn, Cu, Zn, Al) to sand culture media increased the growth of buckwheat. Treated plants showed increased total N contents in stems and leaves, a decrease in seeds, but an increase in true protein in all parts. Trace elements improve the efficiency of utilisation of N and P by the plants. A. G. P.

Will iodine come to be considered an essential plant nutrient? W. L. Powers (Science, 1939, **89**, 434—435).—In water and soil cultures I increases yields of lucerne, clover, and lettuce, stimulates ger-

mination in maize, and probably promotes chlorophyll production. Other evidence is reviewed. L. S. T.

Effect of growth-substances on rooting response of cuttings from pine and other woody species. D. A. Komissarov (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 453—456).—Pine, larch, and oak cuttings formed roots in sand under the influence of growth-substances only when shoots in an appropriate physiological condition were used, and when environmental factors were suitable. For this purpose α-indolylacetic was more effective than naphthylacetic acid or its K salt. A. G. P.

Root formation induced by heteroauxin in cuttings of subtropical plants which show difficulty in rooting. N. A. Maximov, M. M. Gocholaschvili, and V. I. Tschoidze (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 187—188).—Successful rooting of *Olea europea*, *O. fragrans*, and *Pilocarpus pinnatifolia* by use of heteroauxin is recorded. A. G. P.

Induced parthenocarpy of water-melon, cucumber, and pepper. C. Y. Wong (Science, 1939, **89**, 417—418).—When applied in lanolin paste or as a 0·05% aq. solution, naphthylacetic acid caused the production of parthenocarpic fruits in cucumber, water-melon, and pepper. Indolylbutyric acid had no such effect on water-melon. L. S. T.

Thiamin and plant growth. W. J. Robbins (Science, 1939, **89**, 303—307).—A lecture. L. S. T.

Colchicine-induced polypoidy in nature. G. H. Bates (Nature, 1939, **143**, 643).—With mustard, all seedlings are stunted in growth after soaking the seeds in 1 : 2000 aq. amorphous colchicine. With rye-grass, colchicine affects a smaller % of seedlings, but to a more marked extent. L. S. T.

Colchicine-induced tetraploidy in flax. V. A. Ribin (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 302—306).—Young flax plants dipped in 0·1% aq. colchicine showed, during subsequent growth, suppressed development of the main stem, but accentuated growth of tetraploid side-shoots. Pollen grains from treated shoots were larger than normal. A. G. P.

Root primordia and colchicine. G. Mangenot (Compt. rend., 1939, **208**, 1105—1107; cf. A., 1939, III, 437).—The cellular hypertrophy in the roots of *Allium cepa* due to colchicine occurs first in the more centrally placed cells of the root primordia and later involves the outer cells. The giant nuclei with a chromatin network and numerous nucleoli have a normal appearance in prophase but chromosome splitting occurs erratically. The daughter cells contain $32n$, $64n$, and $128n$ chromosomes due to previous repeated stathmokinesis. Stathmometaphases differ in type according as the daughter cells are to contain more or less undivided chromosomes together with those which have split. The stathmotelophases are erratic. A max. of $16n$ chromosomes is found in the dividing cells of the apical meristem, which cease to divide before those of the pericycle. J. L. D.

Acenaphthene as a polyploidising agent. E. Fukushima (Proc. Imp. Acad. Tokyo, 1939, **15**, 98—100).—Exposure of the inflorescence of *Brassica alboglabra* under favourable conditions to the vapour of acenaphthene results in the development of pollen grains containing two or four times the normal no. of chromosomes. W. O. K.

Effect of convallarin on seeds of summer wheat. A. S. Afanassieva (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 144—146).—Certain concns. of convallarin (notably 0·5—0·8%) injure the cells of germinating wheat seeds, causing the formation of tumours. No polyploid cells are formed. A. G. P.

Alteration of physiological processes in tomato under the influence of *Cladosporium fulvum*, Cke. L. M. Dorochov (Compt. rend. Acad. Sci. U.R.S.S., 1938, **21**, 85—88).—*C. fulvum* excretes toxins which, in seeds, check the development of the embryo and, in growing plants, poison the cells, destroy chlorophyll, lower the rates of photosynthesis and respiration, and increase transpiration. A. G. P.

"Bakanae" fungus of rice. III. Physiological action of gibberellin on plants. T. Yabuta and T. Hayashi (J. Agric. Chem. Soc. Japan, 1939, **15**, 403—413; cf. A., 1939, III, 627).—Growth of young shoots of barley, buckwheat, ryokuto, rape seed, hechima, tomato, cucumber, cucurbit, and morning glory in water culture containing 0·14 to 3·5 mg. of gibberellin per 100 c.c., or injection of the solution into shoots of cucumber, cucurbit, morning glory, soya bean, and azuki, or application of gibberellin mixed with lanolin to the basal portion of cucumber shoots all result in abnormal elongation similar to that observed with rice seedlings. When *Lamma paucicostata*, Hegelm, a floating weed found in rice fields, is grown in solutions of the above concn. the rate of reproduction and dry wt. of the plant are considerably increased. J. N. A.

Production of experimental tumours in higher plants by inoculation with cobra (*Naja tripudians*) venom. M. Rose and J. Berthelot (Compt. rend., 1939, **208**, 1112—1114).—1% cobra venom injected a short distance behind the growing tip of a young root of *Vicia faba* produces a swelling at the site of injection. The epidermal cells elongate and there is a parenchymatous infiltration into the stele along the site of injection. The wood loses most of its lignin and new medullary rays develop which run obliquely. The pericycle is lost and isolated lignified nodules appear around which layers of cambial tissue are deposited. The cells are often enlarged and resting cells show a dense aggregation of chromatin in the nucleolus. J. L. D.

Influence of digestive enzymes on experimental crown-gall. S. F. Snieszko and J. Paluch (Science, 1939, **89**, 200).—Enzymes such as papain and pepsin are not always effective in the treatment of crown-gall on *Pelargonium* inoculated with *Pseudomonas tumefaciens* (A., 1937, III, 286). In some cases, mechanical injury of crown-gall may effect a total necrosis of the tumours. L. S. T.

Synthesis of growth-inhibitory polycyclic compounds.—See A., 1939, II, 315.

(xxvii) PLANT CONSTITUENTS.

Determination of small quantities of boron in plant material. K. L. Robinson (Analyst, 1939, **64**, 324—328).—B in plant ash is removed by distillation as methyl borate from interfering substances, the ester is collected in excess of aq. NaOH, and the solution evaporated to dryness and treated with freshly-prepared turmeric reagent. The red colour which develops is matched in the Lovibond Tintometer. The relation between no. of red units and mg. of B_2O_3 present is strictly linear. E. C. S.

Determination of copper in hay by the diethyldithiocarbamate method.—See A., 1939, I, 386.

Micro-determination of total nitrogen in plant material. I. Reifer (New Zealand J. Sci. Tech., 1938, **20**, 66—68B).—The sample is digested with H_2SO_4 in a micro-Kjeldahl flask using phosphomolybdic acid as catalyst and the resulting colourless liquid is neutralised (methyl-red) with aq. NaOH–NaF. To an aliquot is added excess of standard NaOBr buffered with H_3BO_3. Undecomposed NaOBr is determined by adding excess of KI and titrating with 0·01N-$Na_2S_2O_3$. A. G. P.

Polypeptide from *Eisenia bicyclis*. I. Eisenin and its hydrolysis products. T. Oohira (J. Agric. Chem. Soc. Japan, 1939, **15**, 370—376).—The isolation of *eisenin*, $C_{13}H_{20}O_6N_4$, m.p. 225—226° (decomp.), $[\alpha]_D^{14}$ −54·3° in water, from fresh or dried *E. bicyclis* (Kjellm), Setchell, is described. It gives an intense biuret reaction and contains 1 CO_2H. Hydrolysis with 25% H_2SO_4 yields *d*-glutamic acid (2 mol.), *d*-alanine (1 mol.), and NH_3 (1 mol.). The NH_3 is easily removed by warm dil. alkali and is probably formed from ·CO·NH_2. J. N. A.

Determination of ethylene evolved by apples and pears. B. E. Christensen, E. Hansen, V. H. Cheldelin, and J. B. Stark (Science, 1939, **89**, 319—321).—The amounts, if any, of saturated hydrocarbons evolved are negligible. A micro-bromination method for determining ethylene in a 35-ml. sample is described and applied to the examination of gases evolved by several varieties of apples. L. S. T.

Composition and by-products of pineapples. J. C. Bodenstein (Farming in S. Africa, 1937, **12**, 437, 448).—Analyses of pineapple juice are recorded and discussed. The ash of the juice contains approx. 50% K_2O. The CaO content is approx. 3 times that of MgO. A negative correlation exists between the K_2O and CaO vals. A. G. P.

Analysis of certain algæ. M. Narasimham and S. N. Pal (J. Indian Chem. Soc., 1939, **16**, 161).—The cellulose, protein, and I contents of 4 species of seaweed are given. J. D. R.

Characteristics and composition of watermelon seed oil (Cuban Queen variety). A. J. Nolte and H. W. von Loesecke (J. Amer. Chem. Soc., 1939, **61**, 889—891).—The glycerides from the seed oil of the named variety of *Citrullus vulgaris* yield linoleic 63·38, oleic 13·03, palmitic 8·84, stearic 5·61, and arachidic acid 0·72%. R. S. C.

Vetivones, the odoriferous constituents of oil of vetiver.—See A., 1939, II, 331.

Constituents of ether- and alcohol-extracts of "matsudake" fungus (*Armillaria edodes*). T. Sasaki (J. Biochem. Japan, 1939, **29**, 325—331).—Extraction of the fungus yields mannitol, ergosterol, hydroxy- and keto-stearic acid, and succinic acid. F. O. H.

***d*-Arabitol in *Fistulina hepatica*.** M. Frère-Jacque (Compt. rend., 1939, **208**, 1123—1124).—An alcoholic extract of *F. hepatica*, previously extracted with light petroleum and ether, contains feebly rotatory *d*-arabitol (9% of dry wt.), m.p. 102—103° (penta-acetate, m.p. 76°), which becomes dextrorotatory in presence of molybdic acid (cf. A., 1935, 844). J. L. D.

Carpotroside, a new glucoside or heteroside from sapucainha (*Carpotroche brasiliensis*, Endl).—See A., 1939, II, 300.

The α-*d*-mannoside of sodium *l*-glycerate in the genus *Polysiphonia* of the Floridaceæ.—See A., 1939, II, 301.

Water-soluble glucosan from barley roots.—See A., 1939, II, 301.

Pentose nucleotides in the cytoplasm of growing tissues. T. Caspersson and J. Schultz (Nature, 1939, **143**, 602—603).—The ultra-violet absorption spectra of the cytoplasms of growing tissues, *e.g.*, cells of the rye embryo, the imaginal discs of *Drosophila* larva, and the root-tip of *Allium*, all show a max. near 2600 A. characteristic of cyclic N bases present in the nucleic acids. The absorbing substances are probably pentose nucleotides. The *Drosophila* and *Allium* materials give a strong orcinol reaction, and a positive test for P in their ignited residues. High concn. of pentose nucleotides in rapidly-dividing tissues is probably a general phenomenon. L. S. T.

Wheat starch. I. Amylopectin and amylose content of various wheat starches. II. Action of amylases on raw wheat starches. III. Action on wheat amylopectin and amylose. O. E. Stamberg and C. H. Bailey (Cereal Chem., 1939, **16**, 309—319, 319—330, 330—335).—I. Pulverisation of 5 wheat starches and fractionation by the electrophoretic method indicate that the proportion of amylopectin (15—17%) is independent of the wheat variety and of the size of the starch granules. The P content is the same in large and small granules, and is almost entirely confined to the amylopectin fraction.

II. Two β-amylase preps. from normal wheat hydrolysed only about 1% of raw wheat starch granules. Two α-amylase preps. from germinated wheat hydrolysed raw wheat starch to a greater extent (4—10%), depending on the amount of enzyme used and the variety of wheat supplying the starch. These varietal differences appear to be due not to differences in granule size but to morphological features. All the starches were easily hydrolysed by both α- and β-amylase when finely pulverised. There was no correlation between the P content of starches and their enzyme susceptibility.

III. Amylose from wheat starch is much more easily hydrolysed by α- and/or β-amylase than is the amylopectin. Amylopectin is hydrolysed most readily by a mixture of the two amylases, least readily by β-amylase. Resistance of amylose to hydrolysis increases with retrogradation, especially in the first two days, but amylopectin shows little change. T. M.

Hemicelluloses of wood of English oak. IV. Structure of hemicellulose-*A*. M. H. O'Dwyer (Biochem. J., 1939, 33, 713—717; cf. A., 1937, III, 161).—The hemicellulose-*A* obtained from oak sapwood by treatment with taka-diastase is identical with the product obtained from heartwood. Prolonged hydrolysis with taka-diastase of the hemicellulose converts it into a mixture of sol. polysaccharide and xylose (2 : 3 by wt.). When dil. mineral acid replaces taka-diastase, the yields are lower and the proportions of polysaccharide and xylose are not const. The polysaccharide, which yields xylose and methyl hexuronate on hydrolysis with dil. mineral acid, is composed of 6 anhydroxylose and 1 methylhexuronic anhydride units. W. McC.

Pine bark.—See A., 1939, II, 301.

Quantitative extraction of carotene from grass. F. E. Moon (J. Agric. Sci., 1939, 29, 295—301).—The material (5 g.) is digested with 40 c.c. of 20% aq. KOH and filtered. The residue is washed 4 times by decantation with industrial spirit and subsequently with light petroleum until the latter remains practically free from colour. The ppt. appearing in the filtered extract is removed and washed with petroleum. The combined alcohol–petroleum extract and washings are well shaken. The petroleum layer is separated and the alcohol fraction is washed 3 times with petroleum. Colour remaining in the final petroleum extract should be entirely removed by 92% methyl alcohol. If this is not so the original alcohol extract must be further washed with petroleum. The combined petroleum solutions are shaken repeatedly with 92% methyl alcohol until this remains colour-free. The final petroleum extract is washed with water and the carotene content determined colorimetrically. A. G. P.

Bergenin from *Mallotus japonicus*, J. Mueller. K. Homma (J. Agric. Chem. Soc. Japan, 1939, 15, 394—396).—Bergenin (cf. Tschitschibabin, A., 1929, 574) has been isolated from *M. japonicus*. J. N. A.

Saponin of *Sarcostemma australe*, R. Br.—See A., 1939, II, 300.

Vanguerin, saponin from *Vangueria tomentosa*.—See A., 1939, II, 333.

Isolation and constitution of the narcotic substance from kawa-kawa (*Piper methysticum*). A. G. van Veen (Rec. trav. chim., 1939, 58, 521—527; cf. A., 1938, III, 970).—The dried and milled stems are extracted with light petroleum; absorption of the more sol. extract by "acid clay" (Java), and extraction of the colourless band with cold alcohol, gives the active marindinin, m.p. 60°, identical with the "dihydrokawain" of Borsche *et al.* (A., 1931, 89; formula given). Marindinin and 10% aq. KOH give an isomeric *acid*, m.p. 133°, converted by 5% aq. H_2SO_4 into methyl alcohol, CO_2, and an αβ-unsaturated methyl ketone, $C_{12}H_{14}O$; the latter is hydrogenated to δ-phenylbutyl methyl ketone, which is oxidised by NaOBr to δ-phenylvaleric acid. A. T. P.

Bitter principles of the juice of *Lactuca virosa*. V. Isolation of lactucin and lactucopicrin. G. Schenk, H. Graf, and W. Schreber (Arch. Pharm., 1939, 277, 137—145; cf. A., 1937, II, 109).—Lactucin (3·75) and lactucopicrin (1·84% of dried juice), but no other bitter principles, are extracted by cold $CHCl_3$ and ether from the water-sol. portion of the dried juice. Treatment with various solvents (boiling) is described. In no case are the bitter principles completely extracted. The change in water-solubility of the substances during isolation is discussed. A. Li.

***Erythrina* alkaloids. New alkaloid, erythramine.**—See A., 1939, II, 349.

Alkaloids of *Roemeria refracta*, DC.—See A., 1939, II, 290.

(xxviii) APPARATUS AND ANALYTICAL METHODS.

Lapicque's non-polarisable electrode. C. Bartorelli (Boll. Soc. ital. Biol. sperim., 1939, 14, 205—206).—A modification of the electrode (Ag coated with AgCl in physiological saline) is described. F. O. H.

Simple instrument for dissecting minute organisms. J. P. Harding (J. Roy. Microscop. Soc., 1939, 59, 19—25).

Home-made electric bone saw. I. M. Wise (Amer. J. clin. Path., Tech. Suppl., 1939, 3, 133—134). C. J. C. B.

Intravenous infusion pump. G. Katz (Science, 1939, 89, 63—64). W. F. F.

Device for viewing precipitin reactions. E. M. Kanne and J. R. McCarter (J. Lab. clin. Med., 1939, 24, 847—848). C. J. C. B.

Localisation of minerals in animal tissues by the electron microscope. G. H. Scott and D. M. Packer (Science, 1939, 89, 227—228).—Tissues were ashed in vac. on the surface of a Ba- and Sr-coated cathode in the electron microscope, and emission pictures due to Mg and Ca obtained. These elements were localised in various histologically differentiated structures. W. F. F.

Biological assay of insulin. I. Precision of curve relating dosage and graded response. C. I. Bliss and H. P. Marks (Quart. J. Pharm., 1939, 12, 82—110).—Mathematical treatment of typical data applied to the development of a dosage–response curve. J. N. A.

Biological assay of extract of male fern. F. Schönheyder (Quart. J. Pharm., 1939, 12, 75—81).—The activity of extracts of male fern and of crude filicin is determined by placing earthworms in varying concns. of the extract or solution and noting the no. of dead worms after 6 hr.; that concn. which kills 50% of the worms in 6 hr. is called the average lethal dose. A curve showing the relationship

between dose and mortality is given; it is linear between 20 and 80% mortality and is very similar to the characteristic curve (B.P. 1932) for the action of digitalis on the frog. Previous methods of assay are reviewed. J. N. A.

Determination of cholesterol and its esters.—See A., 1939, II, 352.

Determination with the photo-electric colorimeter of nitrogen and phosphorus in enzymic digests. W. Roman (Enzymologia, 1939, 6, 89—93).—The photo-electric colorimeter of Millikan (A., 1934, 383), rendered suitable for use with strongly acid and alkaline solutions by using glass cells in place of the vulcanite trough, is used for the determination of P by the phosphomolybdate reduction method (org. P being first converted into PO_4''' by fusion with Na_2CO_3 or treatment with $HClO_4$ and HNO_3) and of N by the Nessler method, org. N being first converted into $(NH_4)_2SO_4$ by the Kjeldahl method ($HgCl_2$ in place of $CuSO_4$ as catalyst). W. McC.

Micro-determination of polypeptide-nitrogen in biological liquids with use of an automatic control. I. Claudatus (Mikrochem., 1939, 26, 305—310).—The polypeptide-N content of the fluids is deduced from the difference between the results of determinations by Kjeldahl's method in samples extracted with trichloroacetic acid and in samples from which the proteins have been pptd. with tungstic acid. An apparatus for micro-Kjeldhahl determinations is described. J. W. S.

Determination of polypeptides in biological liquids containing thiocyanates. P. Valdiguié (Bull. Soc. Chim. biol., 1939, 21, 609—616).—The results of determination of N in compounds of N in liquids containing CNS′ by Kjeldahl's method are vitiated by the fact that CNS′ is not quantitatively determined by the method. The results are 20—30% low due to loss of HCNS, HCN, and N_2. Addition of various catalysts improves the results somewhat, $HgSeO_3$ being the most effective and giving results which are only 5—18% low. The error increases with time and intensity of heating, the optimum conditions being very gentle boiling for 40—45 min. The use of a micro-Kjeldahl flask with a neck 1 m. long has no beneficial effect, whilst addition of a little alcohol, but not glucose, reduces the error slightly. A similar improvement in yield is obtained if, before heating, the mixture with conc. H_2SO_4 is left at room temp. for 5 hr. With mixtures of CNS′ and trichloroacetic acid filtrates from removal of proteins, the error is −20%, whilst with phosphotungstic acid filtrates it is −41%. J. N. A.

Acetylation of choline, and biological determination of small amounts in extracts of organs. M. C. Mentzer, E. Corteggiani, and A. Carayon-Gentil (Bull. Soc. Chim. biol., 1939, 21, 503—508).—Amounts of choline from 1 to 400 μg. can be quantitatively and almost instantaneously acetylated at ordinary pressure by means of acetyl chloride. For the determination the tissue is extracted with acetone or trichloroacetic acid and ether. 1 c.c. of extract corresponding to 0·5 to 10 g. of tissue is evaporated to dryness at 100°, 2—5 c.c. of acetyl chloride are added, and the mixture is left for 5—10 min. and then heated for some min. at 70—80° to remove excess of acetyl chloride. The residue is dissolved in physiological saline or Ringer's solution and determined biologically by its contracting effect on eserinised leech muscle as compared with the effect produced by a definite amount of acetylcholine. The error is 10%. J. N. A.

Parri's cobalt reaction for the identification of barbiturates in urine and body fluids. M. A. Mancini and E. Pecciarini (Biochem. Terap. sperim., 1939, 26, 119—122).—The method, based on the colour reaction given by $CHCl_3$ extracts of the urine with Co acetate and NaOH in methyl alcohol, is described. Primary publication (1924) of the method is claimed for Parri (cf. Oettel, A., 1936, 363). F. O. H.

Biochemistry of silicic acid. VIII. Determination of silica. E. J. King (Biochem. J., 1939, 33, 944—954).—The determination of SiO_2 in tissues and body fluids is described both by a gravimetric method and by colorimetric methods based on the yellow colour of silicomolybdic acid, and the blue colour of reduced silicomolybdate. P. G. M.

Determination of potassium and the potassium content of normal voluntary muscle. J. N. Cumings (Biochem. J., 1939, 33, 642—644).—The advantages of Ag cobaltinitrite as a reagent for the determination of K are discussed. The average K content of voluntary muscle is 0·28% of wet wt. or 0·98% of dry wt. P. G. M.

Specificity of determination of lead with dithizone.—See A., 1939, I, 386.

(xxix) NEW BOOKS.

Tables, factors, and formulas for computing respiratory exchange and biological transformations of energy. T. M. Carpenter (Carnegie Institution, Washington, 1939, 142 pp.).—This book (the 3rd edition) contains 44 tables with data of great val. to investigators of the basal metabolism in men or animals with any type of respiratory apparatus.

The heart sounds in normal and pathological conditions. O. Orias and E. Braun-Menendez (Oxford University Press, London, 1939, ix + 258 pp.).—The orginal Spanish edition of this monograph appeared a few years ago; and this English translation (made by R. A. Gregory) will introduce this work to a wider and equally appreciative audience. Part I deals with history, basic physic and physiological principles, methods of auscultation, and phonocardiographic methods including those involving electrical amplification. Technical details are fully given and critically assessed. Methods of phonocardiographic exploration are set out. Part II deals with the heart sounds in physiological conditions with special reference to the third heart sound and the auricular sound. Part III discusses the heart sounds in disease. Among the conditions reviewed are gallop rhythm, mitral stenosis, disturbances of

cardiac conduction, auricular fibrillation, extrasystoles, and patent ductus arteriosus. The causation and mechanism of production of murmurs and their properties are carefully considered. There is a full bibliography and an adequate index. The text is illustrated and illuminated by 127 figures which have been excellently reproduced and come almost entirely from the authors' original papers. The high standing of the authors is well known, as is their acknowledged mastery of the subject and the importance of the contributions they have made to its advancement. This monograph will be indispensable to every physiologist and to every clinician interested in heart disease. S. W.

Form and causality in early development. A. M. Dalcq (Cambridge University Press, 1938, vii + 197 pp.).—This book gives a good account of all the more important recent experimental studies in the field of early chordate development. It includes a comparative account of the presumptive territiores of chordate eggs as revealed by the intravitam staining methods, and an account of the part played by induction (organiser action) in chordate development. A chapter is devoted to ascidians. In addition to the chapters devoted to chordates there is one on early sea-urchin development and one on regulative morphogenetic processes in a number of invertebrate groups. The reader will also find an account of Dalcq's theory of early development in which he attempts to explain the gastrulation process through the interaction of an antero-posterior with a dorso-ventral field. The book will be intelligible to anyone with an elementary knowledge of early development. There is a bibliography, and author and subject indexes. J. H. W.

De invloed van het achterstrengsysteem op de tonische cortico-spinale innervatie der extremiteiten. Het buigingsverschijnsel der vingers. [Influence of the posterior column system on the cortico-spinal innervation of the extremities. The flexor sign of the fingers.] H. Verbiest (Eduard Ijdo, Leiden, Holland, 142 pp.).—In certain lesions of the posterior roots, posterior columns, medial fillet, thalamus, and post-central gyrus, with an intact motor system, there occurs a "flexor sign" which is associated constantly with loss of sense of position and passive movement. It is elicited by holding the hands vertically, palms towards the examiner, fingers close together, and all joints actively extended. There occurs a slow involuntary flexion of the fingers, little affected by closing the eyes, and a sharp extensor recovery movement which can be voluntarily controlled. Analogous movements are described in the feet The combination of movements is called "athetosoid," resembling athetotic movements in some respects, but differing chiefly in that in the "athetosoid" there is no motor weakness, the movements of stretching can be controlled, and the movements are less grotesque and do not occur at rest.

Iodine and the incidence of goitre. J. F. McLendon (Oxford University Press, London, 1939, 126 pp.).—The natural distribution of I in soil, water, plants, foods, and animals is described in detail. (Full tables of I content of foodstuffs and animal tissues and secretions are given.) The distribution of goitre and cretinism in all parts of the world is presented, with many illustrative maps, and the frequency is related to geological formation. The relation of I to toxic and exophthalmic goitres is also discussed. The value of iodised salt and other prophylactic modes of administration is well illustrated by records from the literature. Finally, methods of I determination in various materials are fully described. This monograph contains much information useful to research workers. (64 figs. and 18 tables.) C. A. K.

Nitrogen metabolism. Physiology of proteins. II. Degradation, synthesis, intermediary metabolism. (i) Protein catabolism. Characteristics, conditions, general mechanisms, promoting and regulating agents. E. F. Terroine (Presses Universitaires de France, 1939, xii + 164 pp.).—Two volumes by this author in the comprehensive scheme of monographs dealing with various aspects of nitrogen metabolism have appeared previously. After a general and special introduction the rate of catabolism, the extent of degradation of the amino-acids, their structure, susceptibility to attack, and the mechanism of deamination are discussed. Catabolic disturbances due to disease, poisons, and extirpation of organs are then reviewed. The *in vitro* attack of amino-acids by tissue extracts is also considered. The relation of the regulating agents—the endocrine organs—to protein and amino-acid catabolism is treated at considerable length. It is concluded that any control exercised must be of a secondary nature, since the sum total of operations which is denoted by protein catabolism is primarily conditioned by the functioning of the organism [B. 600 refs.]. J. H. B.

Biochemistry of tissue proteinases. B. I. Goldstein (Inst. Biochem. Ukrain. Acad. Sci., 1938, 202 pp.).—The monograph deals with the nature, mode of action, and regulation of the activity of tissue proteinases. In particular, the influence of physiological factors, such as age, nutrition, and pregnancy, on the cathepsin activity of various tissues is described. The activity and specificity of cathepsins from animals belonging to different levels of the phylogenetic scale are compared. R. T.

Report of the Medical Research Council for the Year 1937—1938. (H.M. Stationery Office, London, 1939).

Royal Commission on Safety in Mines Report. (H.M. Stationery Office, London, 1938. Cmd. 5890. xxxii + 520 pp.).

Sixteenth Annual Report of the Safety in Mines Research Board, 1937. (H.M. Stationery Office, London, 1938).

Eighteenth Annual Report of the Industrial Health Research Board, to 30th June, 1938. (H.M. Stationery Office, London, 1938).