

BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

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

JANUARY, 1940.

(i) GENERAL ANATOMY AND MORPHOLOGY.

Anastomoses between rectal and uterine veins. E. G. WERMUTH (*J. Anat.*, 1939, **16**, 116—126).—A description is given of these anastomoses based on "normal" findings. Their significance is discussed in connexion with the pelvic blood flow and spread of infection from the uterus, and the part they play in conditions of portal congestion. E. E. H.

Lymphatics of nasal mucous membrane in cat and monkey. J. M. YOFFEY and C. K. DRINKER (*J. Anat.*, 1939, **16**, 45—52).—Good results were obtained by injecting the cranial subarachnoid space with either Indian ink, or $K_4Fe(CN)_6$ and $Fe NH_4$ citrate. The injected fluid probably passes along the outside of the olfactory nerve, as far as the mucous membrane; here it breaks through to fill the meshes of the loose connective tissue of the submucosa; it then enters the numerous large lymphatics of the whole nasopharyngeal mucous membrane and drains into the deep cervical lymph duct. E. E. H.

Lymphatic vessels of heart in frog. P. VONWILLER and M. RINTSCHINO (*Bull. Hist. tech. micr.*, 1939, **16**, 181—186).—The heart lymphatics can be injected with Chinese ink by a micro-pipette introduced into the lymphatic sinus of the bulbos arteriosus. The ventricular and auricular walls are richly supplied with lymphatic networks, but possess no blood-vessel supply. E. E. H.

"Myon," an elementary muscle unit. F. KÖRNER (*Z. ges. Anat.*, I, *Z. Anat. Entw. Gesch.*, 1939, **109**, 609—623).—The "myon" is the smallest bundle of muscle fibres joined to a single tendon fibre bundle. It is regarded as the elementary unit in muscle construction, and its special structure in different muscles is described. W. B.

Pyramidalis muscle: occurrence and size in American whites and negroes. L. E. BEATON and B. J. ANSON (*Amer. J. phys. Anthrop.*, 1939, **25**, 261—269).—From a study of 215 cadavers (195 male and 20 female), a % absence of 20.3% in whites and 12.5% in negroes is recorded. Absence of the muscle is more frequent among males of both races. The muscle is larger in the male, and is on the average shorter in whites than in negroes, but the reverse in the matter of width. W. F. H.

Atrophy of cremaster muscle. J. R. McDONALD and C. W. MAYO (*Arch. Path.*, 1939, **28**, 141—144).—The cremaster muscle frequently shows collections of lymphocytes with fibrous replacement of the muscle fibres. This change occurs most frequently in old

men, especially those with inguinal hernia. (2 photomicrographs.) C. J. C. B.

Effect of complete removal of muscles on gait of rabbit. D. STEWART (*J. Anat.*, Lond., 1939, **73**, 617—625).—A graphical method of analysing gait is described. The gait is not altered by division of the tendons of insertion of two muscles in the calf, while the actual removal of two calf muscles has as much effect on the gait as division of the tendons of insertion of four muscles. E. E. H.

Internal sphincter of urinary bladder. P. CAVAZZANA (*Arch. ital. Anat. Embriol.*, 1939, **42**, 213—233).—An anatomical and histological study on human fœtuses, newborn children, and adults of both sexes as well as other species (dog, cat, rabbit, guinea-pig, hedgehog). The two portions (trigonal and urethral) of the internal sphincter constitute a single anatomical entity the muscular elements of which are clearly differentiated from both bladder and urethral muscle. The connective element of the sphincter is particularly rich in elastic tissue which probably co-operates in maintaining the tonus of its muscular component. S. O.

Smooth muscle of large intestine. G. AUSTONI (*Arch. ital. Anat. Embriol.*, 1939, **42**, 143—199).—The morphological characters of the smooth muscle of the large intestine are essentially the same in man and in the other species examined (baboon, horse, rabbit, guinea-pig). There are two muscle layers, external (longitudinal) and internal (circular). In the first, the muscle fibres form a no. of subserous thickenings (teniæ). The abundant connective tissue of the tæniæ forms thick septa which run in a radial direction and divide the muscle tissue into rather large bundles, which anastomose freely with each other. The tæniæ connective tissue is richly supplied with elastic fibres which, forming bundles together with fibrous elements, run across to the connective septa of the circular layer with which they establish continuity, thus forming a supporting frame to the muscle fibres of this layer. The muscle fibres of the tæniæ are more than twice as long as those in intertæniæ spaces and almost twice as long as the circular fibres; a similar relationship holds true for their vols. S. O.

Connective tissue of wall of human intestine, especially serosa; relations of vessels and Kerkring's folds. A. BENTENRIEDER (*Z. ges. Anat.*, I, *Z. Anat. Entw. Gesch.*, 1939, **109**, 513—543).—The elastic fibres of the serosa of human ileum are arranged as two nets. The fibres of the superficial net run in a transverse direction, those of the deep net in a longitudinal direction. The mesentery of the jejunum is

not inserted vertically but its insertion runs parallel to the surface of the intestine. The *tænia fibrosa* is restricted to the ileum. W. B.

Factors influencing appearance of centers of ossification during early childhood. C. C. FRANCIS (Amer. J. Dis. Child., 1938, 57, 817—830).—Sick children show a lag in epiphysial rating proportionate to the duration and intensity of the constitutional disturbance. When convalescence is completed the epiphysial rating advances again. Epiphysial rating is influenced by available mineral and vitamin-D. Children on a low-mineral ration tend to lag in epiphysial rating. As a corollary of this, children growing very rapidly will tend to lag in epiphysial rating unless they are provided with ample rations of mineral and of -D. When the period of rapid growth comes to a close, the epiphysial rating advances rapidly. Children growing slowly and given a diet rich in mineral and vitamins, particularly -D, tend to advance rapidly in epiphysial rating. C. J. C. B.

Osteopetrosis (marble bones). W. M. CLIFTON, A. FRANK, and S. FREEMAN (Amer. J. Dis. Child., 1938, 56, 1020—1036).—A case report with full roentgenologic, metabolic, chemical, and histologic studies. (3 photomicrographs.) C. J. C. B.

Marble bones. I. Clinicopathological observations. B. KRAMER and B. HALPERT. **II. Chemical analysis of bone.** B. KRAMER, H. YUSKA, and M. M. STEINER (Amer. J. Dis. Child., 1938, 57, 795—808, 1054—1057).—I. A case of the typical juvenile form of marble bones has been described with clinical, pathological, roentgenological, and chemical data. (5 photomicrographs.)

II. % of ash, Ca, and P in the bones of an infant with osteopetrosis where the characteristic lesion was present were distinctly higher than in the corresponding bones of a normal newly-born infant, except in the flat bones of the skull. There was a satisfactory agreement between the ash content as determined by heating dried fat-free bone at 500° and that calc. on the assumption that Ca and Mg exist as carbonates and that P is present as $Ca_3(PO_4)_2$. On the same assumption, determinations of the acid-base balance showed a slightly positive base balance. The significant findings therefore are a high carbonate content and hypermineralisation. C. J. C. B.

Calcinosis universalis with unusual features. A. BLOXSOM and R. A. JOHNSTON (Amer. J. Dis. Child., 1938, 56, 103—109).—This infant showed deposits of Ca in the epiphyses of the long bones, vertebra, and other bones of the skeleton and hyperkeratosis (this has not been observed previously). The condition developed *in utero*. There has been a spontaneous tendency towards diminution of the deposits. C. J. C. B.

Chondrodysplasia; hereditary multiple cartilaginous exostoses. R. B. SCOTT (Amer. J. Dis. Child., 1938, 57, 1075—1084).—Report of 5 cases in a negro family. C. J. C. B.

Osteodystrophia fibrosa. P. SUMMERFELDT and A. BROWN (Amer. J. Dis. Child., 1938, 57, 90—101).—Two cases are described in which a girl 6 years and one 10 years of age exhibited precocious puberty, yellow

pigmentation of the skin, and osteodystrophy, the last progressing to cystic formation which resulted in fractures and skeletal deformity. There were increase in the basal metabolic rate, increase in the blood pressure, disturbance in the lipin metabolism, and decrease in carbohydrate tolerance. C. J. C. B.

Striæ in bones of a set of monozygotic triplets. L. W. SONTAG and G. COMSTOCK (Amer. J. Dis. Child., 1938, 56, 301—308).—While there was some similarity in the occurrence of striæ in these children, there were enough differences to indicate that the hereditary factor is not the only one, if indeed it is a factor at all in the formation of striæ. C. J. C. B.

Anomalies of the bile ducts. R. F. CARTER and H. L. COLLINS (Amer. J. Dis. Child., 1939, 58, 150—161).—Two cases of anomalies of the biliary tract are reported. In one there was cystic dilatation of the extra-hepatic ducts with an unusual arrangement and no. of ducts; in the other, stenosis at the papilla of Vater. The cause, frequency, and clinical features of such anomalies are discussed. (2 photomicrographs.) C. J. C. B.

Congenital abnormalities of gall bladder and extra-hepatic ducts. E. STOLKIND (Brit. J. Child. Dis., 1939, 36, 115—131).—A review of 245 cases in the literature and 31 unpublished cases. C. J. C. B.

Transposition of great cardiac vessels: phylogenetic theory of Spitzer. J. S. HARRIS and S. FARBER (Arch. Path., 1939, 28, 427—502).—A critical review. C. J. C. B.

Disturbances of rotation of intestinal tract. R. McINTOSH and E. J. DONOVAN (Amer. J. Dis. Child., 1938, 57, 116—166).—Anomalies of developmental rotation of the intestinal tract, specifically of that portion of it which is supplied by the superior mesenteric artery, may cause symptoms of obstruction of the lumen of the intestine or of its venous return. 19 cases are reported in which the patients presented the syndrome of organic ileus, most of them with a clearcut picture of duodenal obstruction, and 1 case of gross intestinal hæmorrhage, all traceable to errors of intra-uterine development of the midgut. C. J. C. B.

(ii) DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Mode of formation of diencephalic pouch of hypophysis. M. J. X. MORATO (Compt. rend. Soc. Biol., 1939, 131, 662—664).—In the embryos of guinea-pig and cat the developing pars neuralis of the pituitary contains many cells in process of mitosis, more than in the surrounding areas in the cat. The development of the posterior lobe is not therefore purely mechanical due to folding of the surrounding structures. P. C. W.

Gastrulation and development of notochord in reptiles. K. PETER (Z. ges. Anat., I, Z. Anat. Entw. Gesch., 1939, 109, 493—512).—The cavity of the archenteron in reptiles is formed by invagination and splitting. In the lizard the blastoporic groove becomes invaginated and elongated. The elongated part forms the wall of the archenteron by splitting. It opens into the subgerminal cavity and its dorsal wall

forms the notochord which, anteriorly, reaches the endodermal pad. Later the endodermal cells undergrow the anterior end of the notochord. The cells of the ventral wall of the archenteron disappear by migrating into the surrounding tissues. W. B.

Testicular ova in *Uraeotyphlus narayani*, Seshachar. B. R. SESHACHAR (Proc. Indian Acad. Sci., 1939, 10, B, 213—217).—Testicular eggs in a member of the Apoda are recorded for the first time. Three ova were found in different lobes of the testis of the same animal. All were intratubular, of equal size and about the same stage in development. The nucleus was in the germinal vesicle condition but no distinct chromosome or nuclear network was made out. The nucleus of each ovum contained a large no. of nucleoli as in the normal ova of the female. In one case the nucleoli were extruded into the cytoplasm. It is suggested that these ova have been formed by a transformation of primitive gonidia and that they probably degenerate. W. F. H.

Sex differentiation in trout (*Salmo irideus*) after administration of follicular hormone. E. PADOA (Bio-morphosis, 1939, 1, 337—354).—By adding follicular hormone to the water a partial feminisation of the male genotypes in the fry of *S. irideus* was induced. The opposite effect (masculinisation of the female genotypes) was produced in tadpoles of *Rana esculenta*. W. F. H.

Development of Weberian ossicles and anterior vertebræ in goldfish (*Carassius auratus*). J. M. WATSON (Proc. Roy. Soc., 1939, B, 127, 452—472).—A backward extension of the exoccipitals partly encloses the spinal cord in the region of the 1st vertebra. Fusion of the basidorsals of the 2nd, 3rd, and 4th vertebræ with the first 3 interspinous bones forms an arch which later gives rise to the neural arches and spines of the compound vertebræ. The ossa suspensoria are modified hæmapophyses. Rudiments of Weberian ossicles are present at the 11-mm. stage. The claustrum arises by ossification of connective tissue of the inner wall of the atrium sinus imparis, the scaphium from the basidorsal of the 1st vertebra, the intercalarium partly from the basidorsal of the 2nd vertebra and partly by ossification in the interossicular ligament, and the tripus partly from the basiventral of the 3rd vertebra and partly from the interossicular ligament and the outer coat of the air bladder. W. F. H.

Inheritance of a rib variation in rabbit. E. L. GREEN (Anat. Rec., 1939, 74, 47—60).—Studies on crossing 2 families of rabbits with 12 and 13 ribs, respectively, suggest that the explanation for the difference in no. has a genetic foundation involving several factors and supplemented by extra-genetic influences. Parental hybridity and normal overlapping are insufficient to explain the aberration. The no. of ventral spinous processes and of sternobræ also tends to be transmitted. W. F. H.

Production of robin pigment in White Leghorn feathers by grafts of embryonic robin tissue. M. E. RAWLES (J. Genet., 1939, 38, 517—532).—Pieces of skin from the head region of robin embryos (90—96-hr. stages) were grafted to the

developing right wing bud of 72-hr. White Leghorn host embryos. The hosts at hatching exhibited areas of coloured down on a part or all of the right wing. After moulting the entire graft region became host-coloured. The data proved that robin-coloured feathers on the host arose from host feather germs and that pigment was produced by donor melanophores which migrated from the graft into the proliferating epidermal collar of the host feather germs.

W. F. H.

Experimental studies on genetics of free-living population of *Drosophila*. T. DOBZHANSKY (Biol. Rev., 1939, 14, 339—368).—A review.

New race of *Drosophila miranda*. P. C. KOLLER (J. Genet., 1939, 38, 477—492).—A new race of *D. miranda* (Whitney race) from Mount Whitney, Sierra Nevada, California, is recorded. The morphology of the race is given and the behaviour of chromosomes during the mitotic cycle, in the salivary gland nuclei, and during spermatogenesis in interracial hybrids, is described and contrasted with that of *D. miranda* (Olympic race) from the Puget Sound region.

W. F. H.

Influence of adrenal destruction on prenatal development of albino rat. C. E. TOBIN (Amer. J. Anat., 1939, 65, 151—177).—Adrenals of rat embryos at 17 days and over were destroyed totally or partly by intrauterine cauterisation. The embryos lived throughout the remainder of the gestation period and their wts. were within the normal range of variation. Pituitaries of embryos with total or partial destruction showed decrease in no. of acidophils, degranulation of basophils, increase in no. of chromophobes, and retardation in differentiation of these cell types. There was an increase in colloid content of thyroid follicles, the increase being in proportion to amount of cauterisation damage. Thymus glands showed more advanced cortico-medullary differentiation and increase in no. of reticular cells. Parathyroids showed increase in total size but no change in cell types. The differentiation of ovaries, testes, seminal vesicles, and prostate was not inhibited by total or partial adrenal destruction. W. F. H.

Long-period ultra-violet irradiation of potential somites in gastrula of axolotls. J. BRANDES (Compt. rend. Soc. Biol., 1939, 131, 787—789).—Ultra-violet irradiation of the gastrulas for 20 min. depresses the organising centre and the morphogenetic index. P. C. W.

Ultra-violet irradiation of potential somites of gastrula of axolotls. J. BRANDES (Compt. rend. Soc. Biol., 1939, 131, 785—787).—Ultra-violet irradiation for short periods (10 min.) stimulates the organising centre and increases the morphogenetic index. P. C. W.

Effect of oxidation and reduction on dorsal and ventral explants from amphibian gastrulas. J. BRACHET and L. RAPKINE (Compt. rend. Soc. Biol., 1939, 131, 789—791).—Oxidised glutathione and alloxan tend to inhibit the formation of nerve tissue in the cultures, but reducing agents such as cysteine, reduced glutathione, and thiomalic acid tended to foster the development of a neural tube. It is

suggested that the thiol-proteins intervene in the induction of the nervous system. P. C. W.

Primordial germ cells and comparative morphology of embryomata. Normal and teratomatous embryology. A. PEYRON (Compt. rend. Soc. Biol., 1939, 131, 744—746). P. C. W.

Auxin-like substances in incubated egg and adult chicken. H. BERBIER (Compt. rend. Soc. Biol., 1939, 131, 941—942).—The auxins are not present in the chick embryo up to the 12th day. Later they appear and are also present in the amniotic fluid and allantois. In the adult they have an irregular distribution, being found chiefly in the excretory organs and being absent from liver, heart, and muscle. P. C. W.

Auxin-like substances in chick embryo. H. BERBIER (Compt. rend. Soc. Biol., 1939, 131, 943—944).—Acid hydrolysis liberates auxins from the blastula and gastrula of *Discoglossus* and from the chick embryo when the method of diffusion in agar does not extract any. P. C. W.

(iii) PHYSICAL ANTHROPOLOGY.

Structural changes of human jaw with age. P. SANTONÈ (Arch. ital. Anat. Embriol., 1939, 42, 234—337).—A study of 65 samples (7 months' old fetus to 96th year of life). The structure of the jaw, as that of other bones, is influenced by both growth and mechanical factors. The changes taking place with age are described in detail. S. O.

Location of porion in the living. M. F. ASHLEY-MONTAGU (Amer. J. phys. Anthrop., 1939, 25, 281—295).—The site of the porion is on the average 9.6 mm. medial to a point 5 mm. vertically above a point situated 2 mm. behind the central point of the external border of the roof of the cutaneous external auditory meatus. W. F. H.

(iv) CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Spodographic research on mammary gland of cavy. E. ALLARA (Bull. Histol. tech. micr., 1939, 16, 157—176).—Micro-incineration shows that the inorg. constituents of the mammary gland vary at different phases of the cycle. The ash increases during the first part of pregnancy, then diminishes, and then increases again; it diminishes during lactation. The epithelium of the ducts and of the stroma also shows variations. E. E. H.

Chromaffin system of viscera and its relation to insular system. V. ERSFAMER (Z. ges. Anat., I, Z. Anat. Entw. Gesch., 1939, 109, 586—608).—The adjective "chromaffin" is applied to granular cells of endodermal origin. The granules give a positive chrome, Ag, and diazo-reaction and are fluorescent in Wood's light. The cells contain enteramin and are found in the whole length of the intestine, in the intra- and extra-hepatic portions of the bile ducts, in the pancreatic duct, and in the pancreatic acini and islets. W. B.

The Anitschkow "myocyte." J. C. EHRLICH and B. LAPAN (Arch. Path., 1939, 28, 361—370).—The

Anitschkow "myocyte" is a normal constituent of the human and vertebrate heart during the embryonal and postembryonal stages of development. This cell is part of the supporting tissue of the heart and belongs to the fixed elements of the reticuloendothelial system. It plays a definite rôle in inflammatory and other defence reactions. The name "myocardial reticuloocyte" is suggested as a more accurate designation for this cell. (8 photomicrographs.) C. J. C. B.

New formation of elastic tissue in adhesions between serous membranes and in myocardial scars. C. H. BUNTING (Arch. Path., 1939, 28, 306—312).—In adhesions between serous membranes and in scars, where both are subject to alterations of tension and relaxation, abundant elastic tissue is developed with its main direction parallel to the line of tension. (5 photomicrographs.) C. J. C. B.

Nerve supply of lachrymal ducts. E. V. STAUDACHER (Arch. Fisiol., 1939, 39, 153—163).—The lachrymal ducts are richly supplied with nerves. Ag impregnation shows two main plexuses: (1) a deep, rather wide-meshed network giving rise to (2) a sub-epithelial plexus formed by single fibres or thin bundles containing some amedullated elements. Fibres from (2) enter Horner's muscle, others join the connective-elastic framework of the duct walls or the basal membrane of the epithelium, and others give rise to networks of a delicate fibrillar structure which surround the epithelial cells. There are various types of sensory nerve corpuscles, scattered in the connective tissue or immediately below the basal membrane. A similar, if less rich, supply is found in the lachrymal sac and naso-lachrymal ducts. S. O.

Innervation of gum of *Talpa europea*. W. LEWINSKY and D. STEWART (J. Anat., 1939, 16, 53—56).—In the mole the nerve supply of the gum is much richer than in man. In man the nerve endings are in coils; in the mole there are free endings, terminal swellings, and definite touch menisci. E. E. H.

Survival and growth of human and rabbit tissues (normal and neoplastic) on the chorio-allantois of chick and duck embryo. E. W. HURST, B. COOKE, and G. C. MCLENNAN (Austral. J. Exp. Biol., 1939, 17, 215—224).—Malignant human cells and normal cells of man and rabbit frequently survive and multiply on the chorio-allantoic membrane. So far, sufficient growth to enable grafts to be passed in series has not been obtained. D. M. N.

Stimulation of growth of *in vitro* fibroblast colonies by extracts of adult tissue. L. DOLJANSKI, R. S. HOFFMANN, and E. TENENBAUM (Compt. rend. Soc. Biol., 1939, 131, 432—434).—Extracts of brain, smooth muscle, ovary, lung, pancreas, testis, bone marrow, spleen, kidney, and liver from the adult all stimulate the growth of *in vitro* colonies of fibroblasts. P. C. W.

Regenerative reactions of neurones cultured *in vitro*. G. LEVI (Compt. rend. Soc. Biol., 1939, 131, 821—823).—Neurones cultured *in vitro* and damaged by micro-manipulation have great regenerative power. The axons and dendrites may even regenerate after separation from the nucleus. P. C. W.

Influence of veronal, sodium veronal, luminal, and sodium luminal on cultures of iris epithelium. K. FUKU (Folia pharm. japon., 1939, 26, 109—111).—The influence of these substances on iris epithelium removed from the eye of chicken embryos was examined by the cover-slip method. They all inhibit growth in increasing degree with their concn. Luminal acts slightly more strongly than veronal, but there is no difference between luminal and veronal and their Na salts. Degenerative changes occur in the tissues when growth diminishes, and finally the tissue dies. Cultures after 7—8 passages through a veronal medium (0.005M.) slowly regenerate if brought into normal culture media, but after 9 passages are no longer able to recover. They recover if brought alternately into normal media and media containing 0.001M-veronal, but cannot recover in the normal media completely when the alternate media contain 0.005M-veronal, and degenerate slowly and die. If 0.005M-veronal medium is used continuously for 4 passages the tissue is as much damaged as a tissue after 6 passages through veronal medium, a passage through the veronal medium being followed by one through a normal medium. This is due to the cumulative action of veronal. E. R.

Ultimate composition of biological material.
III. Glandular tissues. R. PRESS and W. R. FEARON (Sci. Proc. Roy. Dubl. Soc., 1939, 22, 157—159).—Spectroscopic examination of the ash of pituitary, pineal, adrenal, and testicular tissue of the horse, cow, sheep, and pig is recorded. Na, K, Ca, Mg, Fe, Cu, and Mn occur throughout, but Pb, Al, Rb, Zn, and Sr only sporadically. S. H. H.

New mounting media. R. A. GROAT (Anat. Rec., 1939, 74, 1—6).—Two new resins, Nevillite V and Nevillite No. 1, which are cycloparaffin poly-merides, are recommended as mounting media. Alike in nearly all respects except n (1.544 and 1.567 respectively), they are inexpensive, water-white, inert, neutral, and chemically homogeneous and have high m.p. Nevillite V is colour-stable; Nevillite No. 1 yellows only to a slight degree with age. Toluene is the most satisfactory solvent. W. F. H.

(v) BLOOD AND LYMPH.

Hæmatology of sternal marrow in women. H. H. PITTS and E. A. PACKHAM (Arch. intern. Med., 1939, 64, 471—482).—Normal vals. are given from a study of the hæmatology of blood and sternal marrow of 40 pregnant and 24 healthy non-pregnant women. C. A. K.

Sternal marrow of children in normal and in pathologic states. P. VOGEL and F. A. BASSEN (Amer. J. Dis. Child., 1938, 57, 245—268).—A simple puncture technique for obtaining bone marrow from infants and children is discussed and observations on the marrow of 41 normal subjects and of 72 subjects with various types of blood dyscrasia and with other diseases are presented. (4 photomicrographs.) C. J. C. B.

Phagocytosis in cells of exudates and transudates. L. WALK (Folia Hæmat., Lpz., 1939, 62, 126—132).—Tumour cells in exudates show no phago-

cytic activity towards Indian ink particles; histiocytes in tumour exudates take up the particles. Histiocytes in exudates during cardiac or renal failure frequently contain red cells. A. S.

Fate of bone marrow cells after infection *in vitro*. I. Healthy subjects. II. In disease. Z. GALINOWSKI (Folia Hæmat., Lpz., 1939, 62, 71—92, 225—253).—I. Heparinised suspensions of bone marrow were infected *in vitro* with pneumococci, staphylococci, or *B. coli* and kept in an incubator. Granulocytes disintegrated more quickly than lymphocytes or normoblasts. Young neutrophil granulocytes, normoblasts, and megakaryocytes survived longer than more mature cells. The rate of disintegration of neutrophils corresponds with their phagocytic activity (*i.e.*, max. activity in mature cells; least activity in promyelocytes). Phagocytosis of myeloblasts was not observed. Eosinophil granulocytes showed negligible phagocytosis.

II. Bone marrow cells of patients suffering from pneumonia and various other febrile conditions showed diminished phagocytosis. Recovery of phagocytosis during convalescence begins in mature cells. A. S.

Modified peroxidase stain for blood and bone marrow films. F. L. ARMITAGE (J. Path. Bact., 1939, 49, 579—580). C. J. C. B.

Pasteur reaction in erythrocytes. GIOVANNI MORUZZI, GIUSEPPE MORUZZI, and M. A. BARTOLI (Arch. Sci. Biol., Napoli, 1939, 25, 178—188).—The aerobic production of lactic acid by suspensions in saline of washed rabbit erythrocytes (in presence of 0.2% glucose and 0.005% methylene-blue) is inhibited by 0.001M-NaF to the same extent (25%) as is respiration (*cf.* A., 1938, III, 59). S. O.

Red blood count of healthy female adolescents between 13 and 20 years. K. WEDEMEYER (Folia Hæmat., Lpz., 1939, 62, 203—214).—Hæmoglobin content and red cell count of healthy female adolescents (282 subjects) increase from 13 to 16 years; there is a further increase between the age of 18 and 20. A. S.

Blood picture during alarm reaction. A. J. DALTON and H. SELYE (Folia Hæmat., Lpz., 1939, 62, 397—407).—The alarm reaction was elicited in rats by subcutaneous injection of 1 c.c. of 4% formaldehyde, and by exercise of varying severity in a revolving drum. Rabbits were intraperitoneally injected with 3 c.c. of the formaldehyde solution. There is an initial decrease in the white cell count, followed by a neutrophil leucocytosis and an increase in red cell count due to blood concn. The red cell count was diminished up to 72 hr. after muscular exercise. The no. of eosinophils decreases during the leucocytosis and increases when the white cell count returns to normal. The reticulocyte count is increased during the alarm reaction. A. S.

Blood values of caracul sheep correlated with organic constitution. E. P. PANFILOVA (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 569—572).—Data on hæmoglobin content and erythrocyte size in caracul sheep show that dams with greater body-wt. have higher hæmoglobin vals. and vice versa. The

coarser built animals have larger erythrocytes and higher hæmoglobin vals. W. F. F.

Granulation of red cells in malaria after injection of milk. A. SCHLESINGER (Folia Hæmat., Lpz., 1939, 62, 137—139).—Intramuscular injection of milk in patients suffering from malaria produces granulation of erythrocytes (Schüffner's and Maurer's granules). Injections of milk into patients suffering from fever of non-malarial origin produce toxic granulation of neutrophils. A. S.

Basophilia from drinking water containing lead. A. WINKLER and H. WIESBROCK (Z. Hyg., 1939, 121, 433—437).—In a district where the drinking water contained up to 1.1 mg. of Pb per l., 24.3% of 375 children examined showed over 500 basophil erythrocytes per million erythrocytes in the blood. The max. was 2300 per million and the average for all subjects 230. In another district where the water supply was satisfactory 318 children were examined and showed an average of 50 basophil cells per million, with vals. of 300—500 in 2.8% of cases, and no vals. above 500. M. A. B.

Myelogenic osteopathy. N. MARKOFF (Folia Hæmat., Lpz., 1939, 62, 337—366).—Osteoporotic conditions (osteomalacia, polycythæmia) show initially hyperplasia of the bone marrow. Repeated intramuscular injections of 1 mg. of histamine into rabbits or experimental hyperthyroidism produce increased red cell and reticulocyte count and hæmoglobin concn. due to marrow hyperplasia; X-ray examination shows osteoporosis of femur and tibia epiphyses. Osteoporosis was found in cases of leukæmia. (B.) A. S.

Effect of injections of fresh and hæmolysed blood on red cell formation. J. SCHERNHARDT (Folia Hæmat., Lpz., 1939, 62, 93—96).—2 or 20 c.c. of citrated fresh blood were intramuscularly injected over 10 days into normal subjects; 2 or 15 c.c. of hæmolysed blood were intravenously injected over 3 days. The small quantities increased, and the larger doses decreased, the red cell count. A. S.

Interaction between phosphatides of the plasma and corpuscles. L. HAHN and G. HEVESY (Nature, 1939, 144, 72).—Labelled Na_3PO_4 was administered to rabbits and hens and labelled phosphatides appeared in the plasma. Plasma from the treated animals was shaken with red blood corpuscles from untreated animals and the partition of labelled phosphatides studied. Slight exchange only occurred. *In vivo* exchange was also slight. W. F. F.

Evaluation of oxalate solutions for determination of packed cell volume in human blood. J. M. LEICHSENRING, E. G. DONELSON, L. M. WALL, and M. A. OHLSON (J. Lab. clin. Med., 1939, 25, 35—43).—Of the various concns. tested, 1.6% K oxalate, prepared from the dried salt, was most nearly isotonic with human blood. 1.4% K oxalate and 1.2% Na oxalate were hypotonic, whereas 1.8% K oxalate was hypertonic. No differences were observed in the tonicity of the blood of subjects under basal and non-basal conditions. C. J. C. B.

Effect of anæmia on mineral content of red cells and plasma. F. SCHMITT (Dtsch. Arch.

klin. Med., 1939, 184, 310—315).—The Cl content of red cells in pernicious anæmia is increased. Secondary anæmia shows an increased Cl, Na, and K content of erythrocytes. Normal vals. were obtained after treatment. A. S.

Nicotinic acid, pentose nucleotides, and anæmia. J. P. MCGOWAN (Nature, 1939, 144, 244—245).—Nicotinic acid is a necessary adjunct to the nucleotides in the formation of co-enzyme. In anæmia there is amitosis of the hæmopoietic system due to lack of the nicotinic acid-pentose nucleotide factor. W. F. F.

Effect of bilirubin on erythropoiesis (A) after hæmorrhage, (B) in anæmia. A. ZIH (Z. ges. exp. Med., 1939, 106, 132—135, 136—138).—(A) Erythropoiesis in rabbits, made anæmic by bleeding, is stimulated by daily intravenous injection of 1 mg. of bilirubin. 10 mg. diminish erythropoiesis.

(B) Erythropoiesis is stimulated by repeated intravenous injections (3—7 times) of 25—30 mg. of bilirubin in patients suffering from post-hæmorrhagic or hypochromic anæmia. A. S.

Staining reticulocytes for demonstration purposes. D. M. PRYCE (J. Path. Bact., 1939, 49, 594—597). C. J. C. B.

Effect of nicotinic acid on reticulocytes. A. FERRANNINI and F. MURATORI (Boll. Soc. ital. Biol. sperim., 1939, 14, 376—377).—Intramuscular injection of nicotinic acid (6 mg.) or adrenaline (2.5 µg.) increases reticulocyte count (max. after approx. 5 and 24 hr., respectively) in rats. Clinical trials with nicotinic acid were not decisive in 3 cases of anæmia. F. O. H.

Parasitisation of erythrocytes by *Plasmodium vivax*, with special reference to reticulocytes. G. VRYONIS (Amer. J. Hyg., 1939, 30, c, 41—48).—Counts of erythrocytes, reticulocytes, and ring forms of *P. vivax* before, during, and after the 9th, 11th, and 17th chills were studied by supravital technique in a patient having quotidian chills. Infection of reticulocytes was over 100 times as great as that of mature erythrocytes. This relationship was enhanced at shorter intervals after the chill, and remained the same at similar intervals after the 9th, 11th, and 17th chills despite the increase in reticulocytes and decrease in parasites. A transient increase in reticulocytes occurred in the early stages of malaria infection. The susceptibility of reticulocytes to *P. vivax* is probably due to their stickiness which favours the attachment of the parasite. B. C. H.

***Bartonella muris* anæmia. Effect of the antianæmic liver factors.** M. LOURAU, G. S. DE SACY, and A. ARTHUS (Sang, 1939, 13, 749—762).—*Bartonella* anæmia is microcytic and hypochromic in type. As the liver antianæmic factors have no effect in treatment these anæmias are of no val. for testing liver extracts. C. J. C. B.

Relationship between pernicious and achylic hypochromic anæmia. G. E. MERIKAS (Wien. Arch. inn. Med., 1939, 33, 39—50).—Report of two patients who suffered from hypochromic anæmia and gastric achylia. The differential count showed

megalocytes. The patients improved on liver and Fe treatment. A. S.

Erythropoiesis in case of pernicious anæmia. H. E. BOCK and B. MALAMOS (*Folia Hæmat.*, Lpz., 1939, **62**, 408—429).—The recovery of a patient suffering from severe pernicious anæmia (red count 0.5 million) under liver treatment is described. Bone marrow of megaloblastic type was changed into erythroblastic marrow 48 hr. after commencement of treatment. The max. increase in red cell count per day was 0.25 million and 5% hæmogoblin. A. S.

Anæmia of old women. M. FAURE-BEAULIEU, R. CAHEN, and M. FELD (*Sang*, 1939, **13**, 739—748).—A general discussion. C. J. C. B.

Action and sources of copper in nutritional anæmia. C. P. SEGARD (*Amer. J. digest. Dis.*, 1939, **6**, 315—318).—A crit. review. C. J. C. B.

Anæmia in renal disease. I. Fate of red cells in renal and essential hypertension. H. E. BOCK and L. WEYAND (*Dtsch. Arch. klin. Med.*, 1939, **184**, 369—404).—5 patients with nephroangiosclerosis (average blood pressure of 215/130 mm. Hg) and angiospastic retinitis showed an accelerated destruction of red cells, increased fragility, and anæmia; the reticulocyte count was normal. Plasma vol. was increased. 3 patients with chronic glomerulonephritis showed hastened red cell destruction, diminished red cell count and plasma vol.; fragility was normal. A. S.

Effect of nicotinic acid on blood picture of anæmics. A. FERRANNINI and F. MURATORI (*Boll. Soc. ital. Biol. sperim.*, 1939, **14**, 559—560).—Intramuscular injection of nicotinic acid (50 mg. daily) has a varying effect on the blood picture. The leucocyte count is unchanged, but in some cases a significant increase in reticulocytes and erythrocytes occurs. F. O. H.

Congenital and familial hæmolytic disease in children. R. DEBRE, M. LAMY, G. SEE, and G. SCHRAMECK (*Amer. J. Dis. Child.*, 1938, **56**, 1189—1214).—25 cases occurring in 14 families are described. Icterus, red cell fragility, and anæmia are not const. in children. Splenomegaly was const. while adenomegaly, a peculiar ocular lesion, and deformities of the cranial bones, continuous fever, and cardiac disturbances occurred. C. J. C. B.

Purpura hæmorrhagica from sedormid. H. H. HUBER (*J. Amer. Med. Assoc.*, 1939, **113**, 674—675).—A case report. C. A. K.

Acute hæmolytic anæmia after sulphanilamide. W. ANTOPOL, I. APPLEBAUM, and L. GOLDMAN (*J. Amer. Med. Assoc.*, 1939, **113**, 488—489).—Two cases of acute hæmolytic anæmia following sulphanilamide showed intense auto-agglutination. C. A. K.

Staining of leucocyte granules by Sudan-black B. H. L. SHERIDAN (*J. Path. Bact.*, 1939, **49**, 580—581). C. J. C. B.

Pelger's cells in mammalian blood. W. KNOLL and G. SCHMIDT (*Folia Hæmat.*, Lpz., 1939, **62**, 40—42).—Pelger's types of neutrophil leucocytes were found in *Edentata*, *Rodentia*, *Myrmecophaga*, *Tamandua*, *Manis*, and in whales. A. S.

Two German families with Pelger leucocytes. W. TISCHENDORF (*Folia Hæmat.*, Lpz., 1939, **62**, 254—260).—The Pelger anomaly of the white cells was observed in 2 families as a dominant non-sex-coupled factor. The anomaly is due to an inhibition of the maturation of the nuclei of the myelocytes. Monocytes also show the Pelger anomaly. A. S.

Leucocytosis-promoting factor in inflammatory exudates. V. MENKIN (*Science*, 1939, **90**, 237—238).—Introduction into the dog's blood stream of exudative material, obtained as a result of physical injury, induces leucocytosis. The effect is not due to the presence of leucotaxine. W. F. F.

White cells with Auer "rods" in acute leukæmia. J. ARNETH (*Folia Hæmat.*, Lpz., 1939, **62**, 145—183).—A patient suffering from acute leukæmia showed many white cells with 1—3 Auer "rods"; these cells are considered as large lymphocytes, and not as myeloblasts or paramyeloblasts. Auer "rods" are azurophil granules; they were not observed in promyelocytes or myelocytes. The origin of thrombocytes from normoblasts is denied. (B.) A. S.

Proliferation of myeloid and lymphoid cells induced by extracts of urine from leukæmic patients. F. R. MILLER, J. T. WEARN, and R. W. HEINLE (*Proc. Soc. Exp. Biol. Med.*, 1939, **41**, 479—480).—33 out of 34 guinea-pigs receiving urine extracts from patients with myeloid leukæmia showed myeloid metaplasia in liver and spleen and myeloid white cell hyperplasia of bone-marrow. Guinea-pigs receiving extracts from cases of lymphoid leukæmia or multiple myeloma showed lymphoid hyperplasia. V. J. W.

Erythræmia and myelosis. E. SCHWARZ (*Folia Hæmat.*, Lpz., 1939, **62**, 261—335).—A patient suffering from chronic myelosis developed erythræmia after splenectomy and X-irradiation. She died 7 years later with signs of acute leukæmia. The close relationship between erythræmia and myelosis is discussed. (B.) A. S.

Blood-glutathione in polycythæmia, leukæmia, and erythroblastic anæmia. P. EMILE-WEIL, A. ASCHKENASY, and L. CAPRON (*Sang*, 1939, **13**, 705—718).—In polycythæmia the total glutathione is constantly increased and varies with the total red cell count. In leukæmia total glutathione is usually a little increased but bears no relation to the leucocyte count, whilst in erythroblastoses total glutathione is variable with a complete absence of any oxidised form. There is also no relation between the glutathione and the basal metabolic rate and the cholesterol level of the blood. C. J. C. B.

Study of case of myeloid megalokaryocytic hepato-splenomegaly. H. DOWNEY and M. NORDLAND (*Folia Hæmat.*, Lpz., 1939, **62**, 1—39).—The patient had a leukæmic blood picture. Necropsy showed that only the spleen was extensively diseased. There was no generalised lymphadenopathy and the bone marrow was not leukæmic. The origin of the megalokaryoblasts from myeloblasts was traced; atypical platelets were formed from megalokaryoblasts and pro-megalokaryocytes. The megalokaryoblasts

in the spleen were derived from basophilic hæmacytoblasts and not from the splenic reticulum. (B.)

A. S.

Cutaneous lesions in monocytic leukæmia.

H. E. FREEMAN and S. KOLETZKY (Arch. Dermatol. Syphilol., 1939, 40, 218—240).—2 cases of monocytic leukæmia with sp. cutaneous lesions are reported. (7 photomicrographs.)

C. J. C. B.

Susceptibility to transmitted leukæmia occurring in pure bred and hybrid mice. M. D. SCHWEITZER and J. FURTH (Amer. J. Cancer, 1939, 37, 224—232).—Spontaneous leukæmias from high leukæmic stock, *Ak*, low leukæmic, *Rf*, and in 1st generation and other hybrids were inoculated into mice of each of the pure stocks and of various hybrid combinations. The leukæmias arising in different hybrids behaved in transmission experiments like the *Ak* leukæmias. All these leukæmias can be transmitted to almost every member of the *Ak* stock and to *Ak* × *Rf* hybrids. All hybrid combinations tested had a substantial proportion of susceptible individuals, indicating dominance of inheritance. The duration of illness and the anatomical characteristics of leukæmia were not modified by the genotype of the host. The susceptibility factors of both *Ak* and *Rf* leukæmias are not allelomorphous. These genetic factors are sp. for susceptibility to transmissible leukæmia and differ from those that determine susceptibility for normal tissue grafts. F. L. W.

Action of benzole and thorium-X on leucocytes.

G. WALLBACH (Sang, 1939, 13, 719—738).—A review of the author's published work on the subject.

C. J. C. B.

Panmyelophthisis in children. T. ILLING (Folia Hæmat., Lpz., 1939, 62, 369—391).—Several cases of panmyelophthisis in children were observed in the course of chronic (malaria, syphilis) and acute infections (measles, parotitis, septicæmia). A cause for the disease was not found in 2 children. Blood transfusions and pentose-nucleotide treatment are recommended.

A. S.

Panmyelophthisis and myeloblastic leukæmia.

H. GEISSLER (Folia Hæmat., Lpz., 1939, 62, 68—70).—Panmyelophthisis was found in a patient by bone marrow puncture. The white cell count diminished rapidly to 100 cells per c.c.; the differential count showed 40—50% myeloblasts and 50—60% lymphocytes.

A. S.

Granulocytopenia and leukæmia. G. VOTH (Folia Hæmat., Lpz., 1939, 62, 184—202).—A patient suffering from agranulocytosis improved with nucleotide treatment; during the recovery he showed a leukæmic blood picture with myeloblasts and promyelocytes. He died some weeks later with signs of acute myeloblastic leukæmia. Granulocytopenia and aleukæmic leukæmia are considered identical. A. S.

Granulocytopenia from sulphapyridine in children. N. ROSENTHAL and P. VOGEL (J. Amer. Med. Assoc., 1939, 113, 584—587).—3 cases, aged 1, 4, and 10 years, are reported, the two latter being fatal.

C. A. K.

Granulocytopenia from sulphapyridine. V. B. DOLGOPOL and H. M. HOBART (J. Amer. Med. Assoc.,

1939, 113, 1012).—2 cases of granulocytopenia (1 fatal) and 2 of leucopenia are reported in 4 children given sulphapyridine for pertussis or pneumonia. The drug depresses maturation of myeloid cells.

C. A. K.

Prevention of hæmorrhages from œsophageal varices in cirrhosis and Banti's disease.

C. H. DRENCKHAHN (Amer. J. digest. Dis., 1939, 6, 462—465).—The treatment consists of lowering the blood viscosity by venesection when the patient's blood count nears the predetermined hæmorrhage threshold for that individual. Lowering of blood viscosity increases the circulation through the liver and thus diminishes the burden on the collateral circulation. This form of treatment should be used only in those cases where hæmorrhages continue to occur after accepted surgical operations have been performed or where the risk of operation is too great. C. J. C. B.

Permeability of red corpuscles of dog to sodium ions.

W. E. COHN and E. T. COHN (Proc. Soc. Exp. Biol. Med., 1939, 41, 445—449).—After intravenous injection of salts of radioactive ²⁴Na, the relative amounts in plasma and cells show that a simple equilibrium exists between plasma- and cell-Na.

V. J. W.

Osmotic resistance of marrow and circulating red cells. E. FIASCHI and S. BEDINI (Boll. Soc. ital. Biol. sperim., 1939, 14, 483—484).—Comparative data for the osmotic resistance of erythrocytes and reticulocytes are tabulated and discussed.

F. O. H.

Action of drugs on hæmolysis and agglutination.

V. PAPILIAN, C. C. VELLUDA, and F. ANTONESCU-MAZILU (Folia Hæmat., Lpz., 1939, 62, 133—136).—Hæmolysis of rat's erythrocytes on addition of rabbit's serum is accelerated by pilocarpine or ergotoxine and prevented by adrenaline; this was also observed if inactivated serum (heated to 56°) was used. Agglutination of guinea-pig's red cells on addition of rabbit's serum is increased by ergotoxine, diminished by atropine or adrenaline, and prevented by pilocarpine. The agglutination of dog's erythrocytes by dog's serum is diminished by adrenaline or atropine and prevented by simultaneous administration of adrenaline and atropine. A. S.

Photodynamic hæmolysis in presence of chlorophyll.

O. REGGIANINI (Biochim. Terap. sperim., 1939, 26, 365—379).—Comparative data for photodynamic hæmolysis in presence of chlorophyll of erythrocytes of various species of animals are tabulated. With herbivores, ingestion of chlorophyll-rich food increases the corpuscular resistance to hæmolysis to a max. val. Erythrocytes of carnivores are more resistant than those of herbivores. F. O. H.

Effect of gastric mucin on the hæmoglobin regeneration in anæmic dogs.

H. S. WIGODSKY, R. A. BUSSABARGER, and S. J. FOGELSON (J. Lab. clin. Med., 1939, 25, 13—18).—In each of 2 series of 4 anæmic dogs, a commercial gastric mucin prep. stimulated hæmoglobin production 55—70% more than could be accounted for by the amount of Fe present in the prep. However, the stimulus was not as great as when ox liver was given. C. J. C. B.

Influence of valine and isovaleric acid on hæmoglobin production. F. S. ROBSCHERT-ROBINS and G. H. WHIPPLE (Proc. Soc. Exp. Biol. Med., 1939, 41, 361—363).—In dogs rendered anæmic by bleeding, hæmoglobin production is increased by addition to diet of *d*- or *l*-valine or isovaleric acid, but not as much as by administration of Fe or liver.

V. J. W.

Effect of ingested sodium chloride on concentration of hæmoglobin. A. G. SHEFTEL (Amer. J. clin. Path., 1939, 9, 554—557).—In 20 normal individuals the ingestion of 5—15 g. of NaCl in 500 c.c. of water caused an average fall of hæmoglobin of 11.2% with a max. between 3 and 4 hr. after ingestion.

C. J. C. B.

Clinical demonstration of iron in skin in hæmochromatosis. H. R. FISHBACK (J. Lab. clin. Med., 1939, 25, 98—99).—Equal parts of sterile solutions of 0.5% $K_4Fe(CN)_6$ and 0.01N-HCl were mixed and injected intradermally so as to form a wheal. A slight blue colour is evident almost immediately, and darkens to a deep blue within 5 min.

C. J. C. B.

Blood substitution fluids. I. E. VINCKE. II. E. VINCKE and H. E. NEVER (Z. ges. exp. Med., 1939, 106, 1—22, 23—41).—I. 19 blood substitution solutions (Ringer, Tyrode) were analysed and their f.p., viscosity, sp. gr., and p_H compared with those of human serum. The actions of 39 solutions were compared on isolated cat's intestine (Magnus' method).

II. The transport of various solutions through the isolated small intestines of guinea-pigs was examined and their effects on peristalsis were compared.

A. S.

Complications after transfusions with conserved blood. P. REGIDOR (Schweiz. med. Wschr., 1939, 69, 682—683).—Hypersensitivity reactions after transfusions with conserved blood can be diminished by intravenous injection of 10—15 c.c. of 10% $CaCl_2$ after the transfusion. Severe jaundice and death occurred in some patients with severe hæmorrhages after transfusion of 600—650 c.c. of conserved blood.

A. S.

Recovery of chickens from acute hæmorrhage. D. WIRTH and F. KUBASTA (Folia Hæmat., Lpz., 1939, 62, 43—48).—37.5—85.5% of the total blood vol. of chickens was removed in various stages. Many erythroblasts, reticulocytes, and polychromatic erythrocytes appeared during the recovery period. There was marked poikilocytosis. Recovery was complete 8—15 days after the hæmorrhage. The white cells counts showed an increase in pseudo-eosinophils and a diminution in the lymphocytes.

A. S.

Addition of synthetic colloid to hypertonic solutions and blood substitutes. G. STIERLEN (Z. ges. exp. Med., 1939, 106, 201—212).—Addition of 3.5% of polyvinyl alcohol potentiates and prolongs the depressant effect of a 7% NaCl solution on c.s.f. pressure in dogs. An addition of a 6% solution of the colloid to saline blood substitutes is recommended.

A. S.

Production of pyrogen in gum acacia by bacteria. Co TUI, M. H. SCHRIFT, and W. F. RUGGIERO (Proc. Soc. Exp. Biol. Med., 1939, 41, 533—

535).—Gum solution which caused no reaction on intravenous administration to a dog caused fever after inoculation with various common pyrogen-producing organisms.

V. J. W.

Preparation of universally compatible ascitic fluid for transfusion. R. M. CHOISSER and E. M. RAMSEY (Amer. J. clin. Path., 1939, 9, 545—548).—Ascitic fluid may be freed of agglutinins and rendered safe for intravenous use in relief of experimental shock in dogs, without the necessity of preliminary cross-matching with the animal's blood, by a process of electro-dialysis, adjustment of the p_H , and subsequent Berkefeld filtration.

C. J. C. B.

Blood volume. VIII. Macrocytic and hypochromic anæmias due to chronic blood loss, hæmolytic, and miscellaneous causes, and polycythæmia vera. J. G. GIBSON, A. W. HARRIS, and V. W. SWIGERT (J. clin. Invest., 1939, 18, 621—632).—In chronic anæmias, regardless of ætiology, plasma vol. is above, and circulating red cells and total blood vol. are below, normal. During recovery the relationship between the increase in circulating red cell and the decrease in plasma vol. is such that total blood vol. slowly increases, returning to normal when recovery is complete. For clinical purposes the hæmatocrit level is a better criterion of the degree of deficit in circulating red cell vol. than the red cell count or hæmoglobin determination. Polycythæmia vera is characterised by an increased total blood vol. due entirely to a great increase in circulating red cell mass. The degree of this plethora is reflected in the erythrocyte level.

C. J. C. B.

Circulating blood volume in cardiac disease. B. STEINMANN (Arch. exp. Path. Pharm., 1939, 193, 24—33).—Blood vol. was determined by a spectrophotometric CO-method. In cardiac disease the blood vol. was usually increased. There were marked variations in the CO concn. of blood in various parts of the body.

H. O. S.

Experimental changes in opsonic index. V. PAPILIAN and I. G. RUSSU (Folia Hæmat., Lpz., 1939, 62, 392—396).—Subcutaneous or intravenous injection of adrenaline (0.1 mg.) in dogs lowers, pilocarpine (1.5 mg. per kg. body-wt.) increases, the opsonic index. The opsonic index is lowered if the reticuloendothelial system is blocked by repeated intravenous injections of Indian ink.

A. S.

Blood typing and cross-matching with plasma and oxalated erythrocytes. T. B. RAY (J. Lab. clin. Med., 1939, 25, 85—86).—750 specimens of blood were grouped and cross-matched, using plasmas and oxalated erythrocytes suspended in 3.5% Na citrate, and were checked with the usual routine method using blood serum and cells suspended in 3.5% Na citrate. Each method gave identical results, but the former gave a more rapid reaction.

C. J. C. B.

Effect of changes in vegetative tonus on iso-hæmagglutinins of human blood. L. GOREZKY and A. ILLÉNYI (Z. Immunitätsforsch., 1939, 95, 474—478).—Injection of ephedrine increases the agglutinin titre by about 25—30%; parasympathetic stimulation decreases the titre, though to a smaller degree.

G. W.

Determination of blood groups by sedimentation. F. SANDER and M. SANDER (Z. Immunitätsforsch., 1939, 95, 268—284).—The serum to be tested is mixed with equal vols. of each of A and B erythrocytes, and placed in Westergren pipettes. The agglutinated erythrocytes sediment very quickly whereas the non-antagonistic mixture needs up to 12 hr. The results are read in the usual way. They are not altered significantly by dilution of the serum or by the erythrocyte concn., the height or diameter of the blood column, or inactivation. The method can be applied also to determine the *M* and *N* factor. Two types of agglutination and subsequent sedimentation can be distinguished, (a) a very coarse agglutinate sedimenting within a few min. and (b) a fine cloudy one which sediments from 20 min. up to 2 hr. Inactivation and changes of the p_H do not change these types. G. W.

Method of counting blood platelets. T. F. WALKER and P. A. SWEENEY (J. Lab. clin. Med., 1939, 25, 103—104).—A modification of Nygaard's method is described. C. J. C. B.

Technique of prothrombin time determination. T. B. MAGATH (Amer. J. clin. Path., Tech. Suppl., 1939, 3, 187—189). C. J. C. B.

Autocatalysis and blood coagulation. T. ASTRUP (Nature, 1939, 144, 76).—In a neutralised solution containing fibrinogen, prothrombin, and $CaCl_2$, inoculation with preformed thrombin did not result in formation of new thrombin. W. F. F.

Effect of bile and vitamin-K on experimentally produced hæmorrhagic diathesis in a human with a total external biliary fistula. I. C. ZUCKERMAN, B. KOGUT, M. JACOBI, and J. Y. COHEN (Amer. J. digest. Dis., 1939, 6, 332—335).—A hæmorrhagic tendency was produced in 2 weeks in a young female with a total external biliary fistula by the feeding of a low-fat vitamin-K-deficient diet and the omission of oral bile feeding. This bleeding diathesis was not alleviated by the oral administration of bile or of -K alone, but both together stopped the bleeding in 5 days; the previously increased coagulation time and Quick prothrombin time returned to normal. C. J. C. B.

Inactivation of prothrombin by purified thrombin solutions. E. T. MERTZ, W. H. SEEGER, and H. P. SMITH (Proc. Soc. Exp. Biol. Med., 1939, 41, 657—661).—Thrombin solutions react slowly with prothrombin, causing its inactivation. Ca or thrombinase alone does not have this effect and the property is destroyed by heat. V. J. W.

Delayed prothrombin clotting time in avitaminosis-A and pellagra-like chicks. H. C. MASON and M. E. SMITH (Proc. Soc. Exp. Biol. Med., 1939, 41, 583—585).—Chicks with vitamin-A deficiency or on the "pellagra-like" diet gave by Quick's method prothrombin clotting times which were longer than those in -K-deficient chicks, but they showed no tendency to hæmorrhage. V. J. W.

Effect of choleic acid of vitamin-K on prothrombin levels of bile fistula rats. E. T. COHN and C. L. A. SCHMIDT (Proc. Soc. Exp. Biol. Med.,

1939, 41, 443—444).—Administration of 10 mg. per 100 g. of choleic acid doubled the blood-prothrombin although it failed to reach normal levels. V. J. W.

Treatment of hæmorrhagic tendency in jaundice, with special reference to vitamin-K. A. M. SNELL, H. R. BUTT, and A. E. OSTERBERG (Amer. J. digest. Dis., 1938, 5, 590—596).—Oral administration of vitamin-K + bile salts increases the concn. of prothrombin and reduces the clotting time of the blood. -K alone does not produce this result if bile is excluded from the intestine; bile or bile salts have some effect, because they facilitate absorption of -K already present in the intestinal tract. C. J. C. B.

Vitamin-K [and blood clotting]. H. P. SMITH, S. E. ZIFFREN, C. A. OWEN, and G. R. HOFFMAN (J. Amer. Med. Assoc., 1939, 113, 380—383).—A new simple test for blood-prothrombin is described, the clotting time being observed after adding 0.9 c.c. of blood to 0.1 c.c. of thromboplastin. Clotting activity is expressed as (clotting time of normal control) ÷ (clotting time of patient's blood) × 100. The test was compared with Quick's method and the effects of vitamin-K administration were studied. C. A. K.

Specificity of thrombin action. A. L. COPLEY (Amer. J. Physiol., 1939, 126, 310—315).—The influence of thrombin on the clotting of human, cattle, horse, and pig sera was examined by the method of serum gelation by ethyl alcohol. Both active and inactive sera, fresh, and those aged by storing, were examined with increased alcohol as well as protein content of the serum-alcohol mixture. Woehlich's observation that globulins, after lowering their point of coagulation (with alcohol) to that of fibrinogen at 54°, are not affected by thrombin, applies to all the proteins in the serum. Thrombin does not accelerate the coagulation of serum and has a strictly sp. effect on the conversion of fibrinogen into fibrin. M. W. G.

Thrombin as hæmostatic agent. E. D. WARNER, K. M. BRINKHOUS, W. H. SEEGER, and H. P. SMITH (Proc. Soc. Exp. Biol. Med., 1939, 41, 655—657).—In rats thrombin is harmless on intramuscular or intraperitoneal injection. When sprayed on to a bleeding surface in hæmophilic human subjects it gave good results in 4 out of 21 cases. V. J. W.

Preservation of oxalated plasma clot for fibrinolytic tests. A. POMALES-LEBRÓN and P. MORALES-OTERO (Proc. Soc. Exp. Biol. Med., 1939, 41, 609—610).—Plasma dried by the method of Flosdorf and Mudd (J. Immunol., 1938, 34, 469) retains its capacity to clot and susceptibility to hæmolysis for 8 months. V. J. W.

Effect of sesamé oil (T-factor) on platelet count. K. B. OLSON (Proc. Soc. Exp. Biol. Med., 1939, 41, 643—644).—0.1 c.c. of oil daily to rats or 15 c.c. daily to a human subject had no significant effect on platelet count. V. J. W.

Heparin and inhibition of blood-clotting. T. ASTRUP (Science, 1939, 90, 36).—Plasma and serum contain substances which are necessary for the inhibitory action of heparin on blood-clotting. W. F. F.

Diminution of toxicity of muscle juice by anti-coagulants [heparin]. H. DYCKERHOFF and K. LOEVENICH (*Z. ges. exp. Med.*, 1939, **106**, 98—104).—Previous intravenous injection of heparin immunises rabbits against lethal intravenous doses of muscle juice. 2 mg. of heparin antagonises 1 c.c. of muscle juice. A. S.

Application of tissue extract method for standardisation of heparin. H. DAM and J. GLAVIND (*Skand. Arch. Physiol.*, 1939, **82**, 221—224).—The author's method for determination of blood-prothrombin (A., 1939, III, 117) was adapted for determining the concn. of heparin preps., using a standard heparin prep. of known strength. A. S.

Anti-coagulant action of a neodymium preparation. H. DYCKERHOFF and N. GOOSSENS (*Z. ges. exp. Med.*, 1939, **106**, 181—192).—The prep. ("Auer 144") contains 100 mg. of Nd salt per c.c. (40 mg. Nd ions). Formation of thrombi in rabbits by damaging the vein with tincture of I or intravenous injection of thrombin or muscle juice is prevented by previous injection of 150 mg. of the prep. 35 mg. per kg. body-wt. prevent coagulation of blood or plasma for at least 6 hr. The lethal dose is 125—150 mg. per kg. 30 injections of 100—500 mg. did not produce untoward effects in patients. A. S.

Anticoagulant activity in vivo of sodium polyacetylenedihydroxysulphonate. E. FERRARINI (*Boll. Soc. ital. Biol. sperim.*, 1939, **14**, 414—416).—Intravenous injection of 20—25 mg. per kg. of the drug has an anticoagulant effect persisting for more than 2 hr. F. O. H.

Toxicology of Congo-red. D. I. MACHT, W. C. HARDEN, and M. L. GRUMBEIN (*J. Amer. Pharm. Assoc.*, 1939, **28**, 495—499).—*In vitro* coagulation of blood (cat) is accelerated by small, and delayed by large, doses of Congo-red. The toxicity of commercial preps. of the dye varies widely in mice and cats. The clinical use of Congo-red is discussed. F. O. H.

Effects of anticoagulants on determination of blood-constituents. I, II. V. CHORINE (*Ann. Inst. Pasteur*, 1939, **63**, 213—256, 367—399).—I. Experiments with the blood of man, sheep, hen, and rabbit show that anticoagulants (*e.g.*, K oxalate, Na citrate, NaF, heparin, hirudin) lead to a reversible transfer of water from cells to plasma. Powerful anticoagulants in low concn. cause less disturbance than others (no disturbance occurs if anticoagulant is added after removal of the corpuscles). The disturbance also occurs if plasma is replaced by serum or the erythrocytes by yeast cells. The cells exhibit selective permeability which is min. at p_H 8.3 and increases rapidly in acid, and slowly in alkaline, media. Urea readily permeates the cells, its passage being unaffected by change in p_H . No evidence of reversible or irreversible transfer of proteins exists (cf. Lehman and Scott, A., 1935, 1393) although the proportion of protein (and of some other constituents) is diminished as a result of adding anticoagulant.

II. During the period 2—24 hr. after blood has spontaneously coagulated, no change occurs in the protein content of the serum. The protein content of serum from whole blood is less than that of serum c (A., III.)

obtained from the plasma of the same blood by coagulation because, during coagulation, water passes out of the cells. The protein content of serum is less than that of plasma because of the elimination of fibrin and the transfer of water from the corpuscles, this transfer resulting from the loss of CO_2 at the time of coagulation. A review is given of methods of determining blood-constituents. W. McC.

Glass electrode vessel for determination of blood- p_H . V. G. BEHRMANN and M. FAY (*Science*, 1939, **90**, 187—188).—The Beckmann electrode is used and the technique is fully described. W. F. F.

Acetic acid and [blood]-alkali reserve. A. FERRANTE (*Arch. Sci. biol.*, Napoli, 1939, **25**, 38—50).—Dogs were injected intravenously with equiv. amounts of HCl, lactic, pyruvic, or acetic acid. HCl produces a large and persistent (up to 5 hr.) lowering of the alkali reserve. Lactic and pyruvic acids produce a smaller temporary decrease, and acetic acid an even smaller but persistent (up to 5 hr.) decrease of the alkali reserve. S. O.

Micro-determination of blood-phosphatase. H. FUJITA (*J. Biochem. Japan*, 1939, **30**, 69—87).—A modification of the *p*-nitrophenyl phosphate method of Ohmori (A., 1937, III, 483), applicable to 0.1 c.c. of blood, plasma, or erythrocytes, is described. Data for phosphomonoesterase content of blood of man, rat, mouse, rabbit, guinea-pig, and goat, and the variation with age and sex, are tabulated. Intravenous injection of adrenaline, insulin, ascorbic acid, and thyroxine into rabbits has no effect on blood-phosphomonoesterase, but the level falls after administration of vitamin-D. F. O. H.

[Serum]-phosphatase activity in chronic arthritis. C. L. STEINBERG and L. C. SUTER (*Arch. intern. Med.*, 1939, **64**, 483—492).—The serum-phosphatase content was normal in cases of atrophic or hypertrophic arthritis, but was raised in Paget's disease. C. A. K.

Alterations in chemical composition of blood in foot and mouth disease in cattle. L. SEEKLES (*Chem. Weekblad*, 1939, **36**, 609—611).—In 32 cases of intestinal foot and mouth disease in cattle the Ca, P, and Mg contents of the blood plasma show large variations but the average is lowered for Ca (7.3) and Mg (1.8) and increased for P (6.7 mg.-%), and in 29 cases the ratio Ca : inorg. P : Mg is displaced towards a higher P content. Similar results are obtained with "indigestion" arising from various causes. The effect of the composition of the plasma and the injection of $CaCl_2$ and $CaCl_2 + MgCl_2$ on the condition of the heart and the occurrence of thrombosis due to pptn. of Ca salts is also discussed. S. C.

Blood-plasma changes and variations in female bovine toxæmias. J. R. BARKER (*Vet. Rec.*, 1939, **51**, 575—579).—The content of Ca, Mg, inorg. P, sugar, and acetone in the blood is considered in relation to milk fever, acetonæmia, grass tetany, lactation tetany, transit tetany, and pregnancy toxæmias. As the incidence of these disorders appears to be confined to females, the recurring physiological crises in the life of the female animal may be primarily responsible. There is a higher

incidence of these disorders following poor weather conditions in June. M. A. B.

Nutritional availability of iron in molasses. R. S. HARRIS, L. M. MOSHER, and J. W. M. BUNKER (Amer. J. digest. Dis., 1939, 6, 459—462).—By the chemical dipyrindyl procedure the availability of Fe in the 3 grades of molasses (1st, 2nd, and 3rd) was found to be 97%, 85%, and 54%, respectively. By the biological (rat) method, the availability was 90%, 80%, and 50%, respectively. Molasses is a rich and inexpensive source of Fe. C. J. C. B.

Simple method for determination of plasma-alkali reserve. H. D. CREMER (Klin. Woch., 1939, 18, 1034).—Lang's apparatus (A., 1939, III, 953) is used and the CO₂ liberated by acid is absorbed by Ba(OH)₂ and titrated with HCl. E. M. J.

Effect of acid and alkaline diet on blood-lead level and mineral content of plasma and red cells. F. SCHMITT and I. RÖTTGER (Dtsch. Arch. klin. Med., 1939, 184, 286—295).—The blood-Pb level in normal subjects is increased after acid or alkaline diets. The Cl concn. in whole blood or red cells is increased by acid and diminished by alkaline diets. A. S.

Relationship between carbonic anhydrase and mineral content of plasma and red cells. F. SCHMITT (Dtsch. Arch. klin. Med., 1939, 184, 300—309).—Carbonic anhydrase, intramuscularly injected into dogs under pernocton anaesthesia, increases the CO₂-carrying power of blood, lowers the p_H of blood, and produces a migration of Cl from red cells into the plasma and an increase in blood-Pb level. Blood-CO₂ and Cl remain unchanged if NH₄Cl was previously given. A. S.

Decarboxylation of acetoacetic acid by normal and diabetic blood. V. BACCARI (Boll. Soc. ital. Biol. sperim., 1939, 14, 400—401).—The power to convert acetoacetic acid into acetone (Rossi, A., 1938, III, 979) is approx. the same in normal and diabetic blood. F. O. H.

Blood-sugar changes in labour and after delivery. A. L. DECAMP (Amer. J. Obstet. Gynec., 1939, 37, 285—287).—Average prenatal fasting blood-sugar was 87 mg.-%. In 25 cases, the average rise during labour was 21 mg. (24%). The highest rise was 151 and the lowest 68 mg. In the hour after delivery there was a further rise of 11% above the labour average to 120 mg., i.e., 38% above normal. Low blood-sugar levels did not occur either during or after the termination of labour. M. H.

Effect of skin extracts on blood-sugar. E. REUSCH (Z. ges. exp. Med., 1939, 105, 743—754).—Skin extracts were obtained by submerging the arms in water for several hr. The water, if given by mouth, has no effect on blood-sugar in rabbits and man. Subcutaneous injection of the preps. lowers the fasting blood-sugar in rabbits. A. S.

Effect of ascorbic acid on blood-sugar of scorbutic guinea-pigs. F. ADDARI and F. VOLPE (Arch. Sci. biol., Napoli, 1939, 25, 393—403).—The fasting blood-sugar is slightly lower in scorbutic than in normal guinea-pigs. Injection of 30 mg. of ascorbic acid increases blood-sugar in normal animals

but produces a marked fall in scorbutic ones and, in some cases, caused a hypoglycaemic shock. S. O.

Effect of ascorbic acid on blood-sugar curve after glucose, adrenaline, insulin, and thyroxine. F. ADDARI and F. VOLPE (Arch. Sci. biol., Napoli, 1939, 25, 372—392).—After injection of 30 mg. of ascorbic acid into guinea-pigs (250—350 g.) the hyperglycaemia caused by glucose is smaller; the effects of adrenaline and insulin are enhanced and the hypoglycaemic action of thyroxine is inhibited. S. O.

Determination of globulin and albumin in serum by photo-electric colorimeter. J. M. LOONEY and A. I. WALSH (J. Biol. Chem., 1939, 130, 635—639; cf. A., 1939, III, 374).—Serum-albumin and -globulin are determined by turbidity measurements in a photo-electric colorimeter after pptn. with sulphosalicylic acid and half-saturation with (NH₄)₂SO₄, respectively, in presence of gum ghatti. E. M. W.

Comparison of Weltmann's coagulation band with Takata reaction, sedimentation rate, and direct bilirubin determinations in serum. K. DIRR and R. LOGEL (Z. ges. exp. Med., 1939, 106, 85—97).—An increase in the Weltmann band usually coincides with a positive Takata reaction and is due to the increased globulin content of the serum. Patients suffering from diseases of the liver have also a positive direct bilirubin test. A. S.

Significance of Weltmann's coagulation band. B. BRENDL (Dtsch. Arch. klin. Med., 1939, 184, 433—445).—Serum coagulability (Weltmann's band) was examined in various clinical conditions. There is parallelism between serum coagulability and sedimentation rate. A. S.

Experiences with Weltmann's serum coagulation in the University clinic in Zürich. T. KELLER (Folia Haemat., Lpz., 1939, 62, 430—461).—The serum coagulation band was enlarged in all types of cirrhosis of the liver, in jaundice, pernicious anaemia, and sprue; it was shortened in infectious diseases, malignant growths, cardiac infarction, and cephalomalacia. A. S.

Takata reaction in serum. E. WAXBURN and C. B. CHERRY (Amer. J. digest. Dis., 1939, 5, 231—238).—92.5% of 94 cases of cirrhosis of the liver gave a positive Takata reaction. Of 31 positive reactions in 931 other cases, 6 out of 81 were cases of severe liver metastases, 10 out of 122 were cases of cardiac decompensation, and 4 out of 4 were cases of acute nephritis. Failure of pptn. in a doubtful case is an indication that cirrhosis is not present. Occasionally the diagnosis of cirrhosis can be made before clinical signs appear. In developing cirrhosis the reaction may be negative at first, to become positive as the disease progresses. C. J. C. B.

Action of arginase and histidinase. H. BAUR (Verh. Schweiz. Physiol., 1939, 14th Meeting, 11—12).—Dialysed inactive liver preps. give full arginase action if a few µg. of ionic Mn are added. Co and Ni act only in much higher concns. Inactivated histidinase is not reactivated by addition of metallic ions. The co-enzyme of histidinase is unknown. Anterior pituitary preps. inhibit the histidinase action. Octo-

pine (α -alanyl- ω -guanidovaleric acid) is destroyed by liver (up to 17%). The decomp. can be increased up to 80% by addition of Mn in 0.002—0.001M. concn.

A. S.

Determination of uric acid in blood with uricase. M. B. BLAUCH and F. C. KOCH (J. Biol. Chem., 1939, 130, 443—454).—The method depends on the decrease in the phosphotungstic coloration after destruction of uric acid by uricase. Approx. 30% of the colour is due to other substances including ascorbic acid, glutathione, phenols, glucose, and amino-acids. Recoveries of added uric acid average 101% for aq. solutions and 93.5% for blood and the average uric acid val. for whole blood is 2 mg. per 100 c.c.

H. G. R.

Application of uricase method to study of changes *in vitro* in uric acid content of certain mammalian bloods. M. B. BLAUCH and F. C. KOCH (J. Biol. Chem., 1939, 130, 455—469).—The increase in uric acid in rat or guinea-pig blood (A., 1938, III, 874) on keeping or by incubation with guanine, xanthine, or hypoxanthine is due to the presence of guanase and xanthine-oxidase.

H. G. R.

Preparation of blood-lipin extracts free from non-lipin extractives. J. FOLCH and D. D. VAN SLYKE (Proc. Soc. Exp. Biol. Med., 1939, 41, 514—515).—Proteins and lipins are pptd. by colloidal Fe and water-sol. extractives washed away. The lipins are then extracted by stirring up the wet ppt. with a mixture of equal parts of alcohol and ether.

V. J. W.

Variations of blood-cholesterol with age. B. MANCA (Boll. Soc. ital. Biol. sperim., 1939, 14, 446—447).—The blood-cholesterol of guinea-pigs increases steadily from 0.0658% at 29—31 days to 0.0920% at 139—141 days of age.

F. O. H.

Sources of error in Widmark's method for determination of alcohol in blood. O. DYBING, K. HANSEN, and G. RASCH (Tids. Kjem., 1939, 19, 114—115; cf. A., 1939, III, 962).—Acetone and related compounds (in diabetics) may interfere, but inhalation or ingestion of ether, narcotics, aromatic hydrocarbons, or fruit does not affect vals. obtained by Widmark's method. Errors are discussed statistically.

M. H. M. A.

Platelet-reducing substance in spleen of thrombocytopenic purpura. R. H. MAJOR and C. J. WEBER (J. Lab. clin. Med., 1939, 25, 10—13).—Spleenic extract from one patient with thrombocytopenic purpura injected intravenously into rabbits produced an increase in the platelet count but an extract from a 2nd patient caused a decrease in the platelets.

C. J. C. B.

Blood-sugar-regulating rôle of spleen. E. AUBERTIN, A. LACOSTE, and R. SARIC (Rev. franç. d'Endocrinol., 1939, 17, 1—56; cf. A., 1939, III, 772).—In the rabbit and dog splenectomy has no const. effect on the regulation of blood-sugar as shown by basal blood-sugar level or glucose-tolerance tests. In the dog rendered diabetic by ligation of the pancreatic duct, splenectomy has no effect on the slow development of the condition. Blocking the reticulo-endo-

thelial system also has no effect on glycoregulation. Of a no. of spleens from normal and diabetic dogs only 1 of the normals showed any hypoglycæmic activity. The literature is critically reviewed. (B.)

P. C. W.

(vi) VASCULAR SYSTEM.

Allusions to a "circulation" of the blood in MSS. anterior to "De motu cordis," 1628. H. P. BAYON (Proc. Roy. Soc. Med., 1939, 32, 707—718).

W. J. G.

Innervation of conduction tissue of heart. P. GOMARASCA (Boll. Soc. ital. Biol. sperim., 1939, 14, 477—478).—Histological observations of nervous tissue in the heart (dog, sheep) are discussed.

F. O. H.

Effect of sympathomimetic substances on excitability of frog's ventricle. H. GEBHARDT and F. METZGER (Arch. exp. Path. Pharm., 1939, 193, 107—109).—Ephedrine prolonged the refractory period; adrenaline, sympathol, and Ca had no effect on its abs. duration. In the case of adrenaline the duration of the refractory period in relation to the total cycle was prolonged.

H. O. S.

"Polarisation" and cardiac rhythm in marine molluscs. H. MARDUEL and A. JULLIEN (J. Physiol. Path. gén., 1939, 37, 554—561).—The isolated hearts of *Mytilus galloprovincialis* and *Murex brandaris* beating in sea-water were quickened by negative "polarisation" (electrodes on cardiac sinus) and slowed by positive polarisation. In NaCl solution alone, the results were irregular and the effects of polarisation reduced, but an increase in alkaline-earth metals (particularly Mg, as Ca was toxic) greatly increased the response to a negative polarising current, although Mg itself slowed the heart. Thus the effect of these ions was to modify the state of polarisation of the heart. In the sea molluscs, min. response to a polarising current was found in a more alkaline medium than that which best maintains the heart beat.

C. A. A.

Effect of drugs on heart of *Helix pomatia*. A. JULLIEN, D. VINCENT, M. VUILLET, and M. BOUCHET (J. Physiol. Path. gén., 1939, 37, 562—572).—Acetylcholine slowed the isolated heart in a concn. of 10^{-7} when perfused by Straub's method, or in a concn. of 10^{-5} when added to the fluid in a bath. The effect was increased in each case by the presence of eserine. Adrenaline in a concn. of 10^{-8} increased the amplitude but had little effect on the rate. If acetylcholine and adrenaline were added together, the acetylcholine effect predominated. Tyramine raised the tone of the heart in a concn. of 10^{-9} , slowed it at 10^{-8} , and stopped it in systole at 10^{-7} . With addition of acetylcholine, the characteristics of both drugs were lost. Histamine in a concn. of 10^{-5} raised both systolic and diastolic tone and caused arrhythmia. The threshold concn. was 10^{-8} .

C. A. A.

Effect of sympathicomimetic amines [on heart volume]. R. CHARLIER (Arch. Mal. Cœur, 1939, 32, 690—710).—The action of the following drugs on the vol. of the heart *in situ* (Henderson's

method) and on blood pressure was determined in dogs under chloralose after section of the vagi: sympathol, neosynephrin, adrenaline, benzedrine, veritol, ephedrine, suprifene, cardiovasculaire, icoral.

G. SCH.

Compensatory hyperdiastole and subsequent hypersystole in various classes of vertebrates. A. CLEMENTI (Boll. Soc. ital. Biol. sperim., 1939, 14, 569—570; cf. A., 1938, III, 373).—In all classes, strong stimulation of the heart produces diastole and subsequent systole of amplitude and duration greater than normal.

F. O. H.

Cardiac sounds after intravenous injection of ozone. T. CHAMORRO and J. C. ETCHEVÉS (Rev. Med., Buenos Aires, 1939, 1, 64—66).—Bubbles of O₃ (injected for therapeutic purposes) reach the heart and produce sounds which were registered graphically.

S. O.

The Lian-Minot electrocardiograph. C. LIAN and G. MINOT (Arch. Mal. Cœur, 1939, 32, 497—505, 790—796).—An electrocardiograph of the cathode-ray type registers simultaneously on film and on a rotating luminous cylinder making the tracing visible at once. Sound and apex beat tracings can be registered simultaneously with the e.c.g. If used without the film, the rotating cylinder can be stopped for close examination of the tracing, which can subsequently be fixed photographically.

G. SCH.

Test of heart function. E. SEMADENI (Arch. Kreislaufforsch., 1939, 5, 31—48).—Exercise shortens the duration of the QRS complex of the e.c.g. or leaves it unaffected in normal hearts but prolongs it in 80—90% of diseased hearts. High-speed film transport is the basis of the technique.

G. SCH.

Effect of vagus and sympathetic on ventricles in man. P. ECKEY (Arch. Kreislaufforsch., 1939, 5, 1—30).—The effects of doryl, digitalis, Ca, atropine, adrenaline, and exercise on an allorhythmic ventricular centre lead to the assumption of a negative chronotropic effect of the vagus on the ventricles and reaffirm the positive chronotropic effect of the sympathetic on them.

G. SCH.

Effect of potassium on heart in man. W. A. R. THOMSON (Brit. Heart J., 1939, 1, 269—282).—In 14 of 24 cases given 3—30 g. of KCl or K citrate daily, T waves of the e.c.g. were heightened during medication. In 2 cases various degrees of heart block were produced temporarily.

G. SCH.

Extrasystoles in children. R. A. LYON and L. W. RAUH (Amer. J. Dis. Child., 1938, 57, 278—290).—Of 2672 children with normal hearts, extrasystoles occurred in 59 (2.2%); of 468 patients with cardiac lesions, the irregularity was noted in 20 (4.3%). In some instances rheumatic fever, diphtheria, congenital heart disease, or emotional or nervous instability seemed to be a predisposing cause, but usually no evident cause of the extrasystoles could be determined. According to the e.c.g. of 22 children, the extrasystoles were ventricular in 16, nodal in 3, and auricular in 3. In only 1 patient was the origin multifocal. There was no evidence that the presence of extrasystoles, *per se*, caused

any impairment of cardiac function or retarded the child's growth and development.

C. J. C. B.

Experimental myocarditis from tonsillar cultures. B. WEICKER and L. RETZLAFF (Dtsch. Arch. klin. Med., 1939, 184, 316—338).—Cultures of tonsillar material were intravenously injected into rabbits. The mortality was 50%. Electrocardiographic signs of myocardial damage were observed in numerous cases (changes of the S-T segment; bundle branch block). Some animals with severe myocarditis on post-mortem examination had not previously shown any e.c.g. changes. Berkefeld filtrates of the cultures did not produce myocarditis. The cultures contained mainly streptococci, also staphylococci and pneumococci.

A. S.

Temporary changes in S-T segment and T waves of the electrocardiogram. K. DIETERLE (Z. Kreislaufforsch., 1939, 31, 487—497).—A review.

G. SCH.

Interference and parasystole in left auricle strips. C. J. ROTHBERGER and A. SACHS (Arch. int. Pharmacodyn., 1939, 62, 417—426).—Strips from the left auricle of the guinea-pig, containing no specialised tissue, can be made to beat rhythmically, especially under the action of poisons. Different rhythms may coexist, parasystole with block and flutter with occasional strong beats.

D. T. B.

Adrenaline and auriculo-ventricular block. D. OLMER, J. OLMER, X. JOUVE, and J. VAGUE (Arch. Mal. Cœur, 1939, 32, 797—807).—In a patient with auriculo-ventricular block with Adams-Stokes syndrome and heart failure the attacks ceased after intramuscular injection of 1—2 mg. of adrenaline intramuscularly for several days; the failure cleared up and the ventricular rate rose from 25 to 30—35.

G. SCH.

Partial systoles and uniformly slowed conduction. [Action of digitalis.] R. LUTEMBACHER (Arch. Mal. Cœur, 1939, 32, 780—789).—Digitalis injected rapidly in high concn. into the lymph sac of frogs paralyses selectively conduction between the base and the apex of the ventricle of the heart and causes base and apex to contract separately. Digitalis administered slowly in low concns. slows conduction uniformly and causes prolonged systoles. The mechanical and electrical peculiarities of these systoles are reviewed.

G. SCH.

Electrocardiographic changes during treatment of schizophrénia by cardiazol. A. BERETTA and M. CAMIA (Boll. Soc. ital. Biol. sperim., 1939, 14, 493—496).—Changes in the e.c.g. of schizophrénics treated with large doses of cardiazol are described.

F. O. H.

Correlation of clinical, electrocardiographic, and circulation time findings in determining the cardiac status in infectious diseases. L. H. SIGLER, P. I. NASH, I. STEIN, and S. EPSTEIN (J. Lab. clin. Med., 1939, 25, 24—32).—Repeated e.c.g. and circulation time determinations were made on 81 patients with acute infectious disease, of whom 69 had lobar pneumonia; e.c.g. changes were frequent. The degree of change was not related to the severity

of disease, the degree of clinical signs, or the circulation time. The circulation time was prolonged more frequently in patients who died than in those who survived, after 45 years of age than before, and when abnormal clinical signs were present.

C. J. C. B.

Changes in rabbit heart under thyroid administration. T. VIZER and G. HABAN (*Arch. Kreislaufforsch.*, 1939, 5, 49—64).—3 rabbits given 2.5 mg. of thyroxine daily died in 9—31 days. 4 rabbits given 0.25 mg. of thyroxine daily died in 80—181 days. Sinus rhythm was maintained to the end; *T* waves increased first but decreased terminally; deep *Q* waves appeared just prior to death. Cellular infiltration occurred and its severity corresponded with the e.c.g. changes.

G. SCH.

***B*₁ avitaminosis and heart disease.** G. BICKEL (*Arch. Mal. Cœur*, 1939, 32, 657—668).—A review.

G. SCH.

***B*₁ avitaminosis and heart failure in pregnancy.** G. BICKEL (*Arch. Mal. Cœur*, 1939, 32, 769—779).—An attempt to attribute slight heart failure during pregnancy to *B*₁ avitaminosis.

G. SCH.

Circulatory function in anæmias of children.

I. Effect of anæmia on exercise tolerance and vital capacity. II. Measurements of blood-oxygen content, circulation time, and venous pressure. C. G. PARSONS and F. H. WRIGHT (*Amer. J. Dis. Child.*, 1938, 57, 15—28, 330—337).—

I. In acute anæmia the exercise tolerance in children is decreased; in chronic anæmia adaptation may be so complete that no diminution of exercise tolerance results. Exercise tolerance tests and measurements of vital capacity are not sufficiently accurate to serve as a measure of cardiac damage resulting from anæmia or to gauge the ability of the heart to recover from such damage through appropriate treatment.

II. 5 children with anæmia showed a smaller arterio-venous O₂ difference and a larger % of utilization of blood-O₂ than normal controls.

C. J. C. B.

Herpes zoster and angina pectoris. J. D. SPILLANE and P. D. WHITE (*Brit. Heart J.*, 1939, 1, 291—302).—The occurrence of herpes zoster in patients with angina pectoris leads to the suggestion that the zoster is a trophic manifestation of continued irritation of the posterior root ganglia by impulses from the diseased organ.

G. SCH.

Myocardial infarction without coronary artery lesions. H. GROSS and W. H. STERNBERG (*Arch. intern. Med.*, 1939, 64, 249—267).—In 15 cases of fatal myocardial infarction there were no significant lesions of the coronary arteries. In 13 cases there was arterial hypertension.

C. A. K.

Effect of anoxæmia on electrocardiogram of cats after coronary ligation. A. LESLIE, W. S. SCOTT, jun., and M. G. MULINGS (*Proc. Soc. Exp. Biol. Med.*, 1939, 41, 652—653).—When the left branch of the left anterior descending coronary is tied the e.c.g. shows deviation of the *RS-T* segment, which returns to normal in 12—29 days. Anoxæmia caused by an atm. of 10% O₂ increases this deviation when it is present and causes it to recur after it has disappeared.

V. J. W.

Phasic blood flow in coronary arteries obtained by a new differential manometric method. D. E. GREGG and H. D. GREEN (*Proc. Soc. Exp. Biol. Med.*, 1939, 41, 597—598).—The blood is caused to pass through a constriction and the relative pressures on each side of the constriction are recorded by an optical method.

V. J. W.

Quantitative relation between reactive hyperæmia and the myocardial ischæmia which it follows. L. N. KATZ and E. LINDNER (*Amer. J. Physiol.*, 1939, 126, 283—288).—The quant. effect on coronary flow of different periods of myocardial ischæmia was observed in an isolated prep. of the dog heart with ventricles fibrillating; in this prep. any change in coronary flow represents an active change in the calibre of the coronary vessels. Blood flow through the fore-limb of the same animals was studied simultaneously under the same conditions. There is normally an ample coronary blood supply of variable extent in this prep. The reactive hyperæmic response is in excess of that needed to make up the deficit sustained during the preceding ischæmia. The stimulus for reactive hyperæmia appears to be a dilator substance eliminated by O₂ and sufficiently diffusible to be washed away in the blood stream. The reaction of the coronary vessels depends not only on the amount of this substance liberated during ischæmia but also on the reactivity of the coronary vascular system, which is variable in the course of an experiment and in different experiments.

M. W. G.

Restriction of coronary flow as factor in heart failure. M. B. VISSCHER (*J. Amer. Med. Assoc.*, 1939, 113, 987—990).—A lecture.

C. A. K.

[**Effect of caffeine on glycogen content of heart.**] P. GOMARASCA (*Boll. Soc. ital. Biol. sperim.*, 1939, 14, 476—477).—Repeated, subcutaneous injection of caffeine (5—25 mg.) into rats decreases the glycogen content of the heart.

F. O. H.

Glycogen, phosphagen, and adenylypyrophosphoric acid content of heart muscle during oxygen lack. H. SCHUMANN (*Z. ges. exp. Med.*, 1939, 106, 59—66).—The average glycogen content of heart muscle of normal rats was 478±9 mg. per 100 g. Phosphagen content was 11.0±0.6 mg. per 100 g.; phosphagen index (*i.e.*, phosphagen P/inorg. P + phosphagen P) was 0.205; adenyly pyrophosphate was 19.6±0.8 mg. per 100 g.; the glycogen, phosphagen, and adenyly pyrophosphate content of heart muscle is diminished up to 50% if the animals are exercised or breathe pure N₂ for 10—180 sec.; inorg. P is increased. The diminution of the substances in trained animals is less marked.

A. S.

Hydrostatic action of baths on circulation. H. J. HEITE and E. LERCHE (*Z. ges. exp. Med.*, 1939, 105, 693—701).—Dogs under morphine-chloralose anæsthesia were put in the recumbent position in a bath and carotid artery blood flow was measured with a thermostromuhr. Cardiac output per min. increased and decreased with the hydrostatic pressure in the bath.

A. S.

Determination of circulation time in man. K. MATTHES and I. SCHLEICHER (*Z. ges. exp. Med.*,

1939, 105, 755—767).—The circulation time in man was determined by means of photo-electric cells after intravenous injection of methylene-blue. Circulation time was prolonged in old age and in cardiac failure.

A. S.
Vascular hormone. E. REMOTTI (Boll. Soc. ital. Biol. sperim., 1939, 14, 510—513). F. O. H.

Effect of anæsthesia on vasomotor reactions due to peripheral stimulation. G. LUGLI (Boll. Soc. ital. Biol. sperim., 1939, 14, 375).—The effect of local anæsthesia on vasomotor reactions due to chemical or mechanical peripheral stimulation (*e.g.*, erythema) or inflammation is discussed. F. O. H.

Contractility of arteries in relation to the circulation of the blood. F. MARCEAU (J. Physiol. Path. gén., 1939, 37, 536—553).—In the eel, the branchial arterial trunk shows variation of diameter with changes of pressure in the heart only if the blood pressure is low. The dorsal aorta contains blood at a much lower pressure (9—12 mm. Hg as against 40—50 mm. in the branchial arteries) but shows no pulsations. In the Hungarian frog arterial contractions were observable, frequently beginning slightly before the rise of blood pressure in systole, and in that case relaxation of the artery preceded the onset of the fall of blood pressure. C. A. A.

Vascular diseases. G. W. SCUPHAM, G. DE TAKÁTS, T. R. VAN DELLEN, and W. C. BECK (Arch. intern. Med., 1939, 64, 590—655).—A review of recent literature. C. A. K.

Reaction of cerebral vessels to intracarotid injection of horse serum in sensitised and non-sensitised guinea-pigs. A. BUERMANN and L. ALEXANDER (Confinia neurol., 1939, 2, 215—219).—Guinea-pigs were sensitised by intraperitoneal injections of horse serum (0.1 c.c.). Re-injection of 0.1—0.5 c.c. of horse serum into the carotid artery produced marked constriction of the cerebral vessels and capillaries on the side of the injection. A. S.

Diameter of lung capillaries in subjects of varying age. E. SLAVICH and A. RISOLO (Boll. Soc. ital. Biol. sperim., 1939, 14, 577—579).—The diameter varied irregularly between 4.94 and 7.53 μ . in subjects aged 10—80 years. F. O. H.

Cerebral blood flow in hypertension, arteriosclerosis, and raised intracranial pressure. D. WILLIAMS and W. G. LENNOX (Quart. J. Med., 1939, 8, 185—194).—Simultaneous resting O₂ and CO₂ contents of arterial and internal jugular blood were determined in 40 cases of hypertension, raised intracranial pressure, and cerebral arteriosclerosis, and in 41 controls. If the average cerebral O₂ and CO₂ metabolism is assumed const., the arterio-venous differences are inversely proportional to the cerebral blood flow. As a check, intracranial angiomas gave low differences. No statistically significant difference from controls was found in any group. It is suggested that the constancy of flow under such different conditions is due to the vasodilating effect of CO₂ excess correcting a stagnant flow, and the vasoconstricting effect of CO₂ deficiency correcting a rapid flow. R. K.

Vasomotor reflexes of sino-carotid origin in sheep foetus. L. DONATELLI (Boll. Soc. ital. Biol. sperim., 1939, 14, 579—580).—The reflexes are evident in the foetus at 3—5 months (duration of pregnancy 5 months). Injection of large doses of adrenaline into the foetus has no effect on the mother; that into the mother produces hypotension and bradycardia in the foetus (small doses have no effect). Similar phenomena occur with acetylcholine. Faradic stimulation of the peripheral vagus in the mother does not affect the blood circulation of the foetus and vice versa. Vascular and cardiac regulation in mother and foetus are therefore independent of each other. F. O. H.

Blood pressure in arteria dorsalis pedis. M. NAUMANN (Z. Kreislaufforsch., 1939, 31, 513—521).—Blood pressure in the arteria dorsalis pedis in healthy subjects below the age of 30 is usually the same as, and past the age of 30 usually higher than, in the radial artery. In infectious diseases and in rheumatic carditis the blood pressure was lower in the arteria dorsalis pedis than in the radial artery. G. SCH.

Range of normal blood pressure. S. C. ROBINSON and M. BRUCER (Arch. intern. Med., 1939, 64, 409—444).—New normal blood pressure levels are suggested from a statistical study of 10,883 persons, from 5 to 10 years' continuous records of 500 persons, and from consideration of mortality rates at various pressure levels. The normal systolic pressure is 90 to 120 mm. Hg., the diastolic 60 to 80 mm., for both men and women. Normal pressures do not rise with age; prehypertensive and hypertensive pressures increase with age. Transient elevations of pressure often become permanent; high blood pressure begins gradually at an early age. The mortality rate increases progressively with an increase of systolic or diastolic blood pressure. C. A. K.

Hypertension due to stimulation of central vagus and pituitary gland. II. V. MARTINI and U. SACCHI (Boll. Soc. ital. Biol. sperim., 1939, 14, 550; cf. A., 1939, III, 896).—The arterial hypertension due to stimulation of the central vagus and its non-inhibition by 933 F. are reproducible in hypophysectomised dogs. F. O. H.

Experimental hypertension and vasoconstrictor substances. H. HERMANN, F. JOURDAN, and A. DELRIEU (Arch. Mal. Cœur, 1939, 32, 545—555).—In a dog under chloralose both adrenals are removed, one kidney is denervated and placed in a plethysmograph, and both common carotid arteries are partly clamped. Hypertension ensues, and the vol. of the kidney first increases but subsequently diminishes again while the pressure remains elevated. In a second experiment on an adrenalectomised dog one kidney is excised, connected to the carotid-jugular circulation, and placed in a plethysmograph. After bilateral section of the vagi and denervation of the carotid sinus the kidney again swells at first and then decreases in size. This decrease in size in both instances is attributed to overproduction and circulation in the blood of sympathin. In surviving dogs made hypertensive through carotid denervation the vasoconstrictor power of the citrated plasma

was increased by between 25% and 50% as estimated by the Laewen-Trendelenburg prep. This increase in vasoconstrictor power was maintained even after denervating one adrenal and, at a later stage, removing completely the other adrenal, leaving the surviving animal without any chromaffine adrenal tissue, thus showing that the vasoconstrictor power of the plasma is independent of adrenal production of adrenaline.

G. SCH.

Venous circulatory changes in abdomen and lower extremities attending intestinal distension. C. J. BELLIS and O. H. WANGENSTEEN (Proc. Soc. Exp. Biol. Med., 1939, 41, 490—498).—Injection of air into the dog's intestine causes a rise in intraperitoneal pressure. Pressure is raised in the femoral vein, is not greatly changed in the vena cava, and gradually falls in the portal vein. Opening the abdomen causes a fall of pressure in the mesenteric veins of the dog and in the intraluminal pressure of the rabbit's gut.

V. J. W.

Effect of chemical irritation of a venous segment on peripheral pulse volume. M. DE BAKEY, G. E. BURCH, and A. OCHSNER (Proc. Soc. Exp. Biol. Med., 1939, 41, 585—590).—Ligature of the dog's femoral vein halves the vol. of pulsations in the foot whether nervous pathways are intact or not. Injection of Na salicylate into or around the vein has the same effect on pulsations but this effect is abolished by procaine injection or by sympathectomy.

V. J. W.

Burette for intravenous injection at constant rate. P. ZAMBONI (Boll. Soc. ital. Biol. sperim., 1939, 14, 416—419).

F. O. H.

Simplified method for scalp vein transfusions in infants. S. A. KAUFFMAN and S. O. LEVINSON (J. Pediat., 1939, 15, 574—577).—The scalp vein technique is simplified and facilitated by use of a modification of the roller pressure apparatus.

C. J. C. B.

(vii) RESPIRATION AND BLOOD GASES.

Transformations of polystichous epithelium of trachea in reparative regeneration. N. I. GOLSCHTEIN (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 178—179).—The regeneration of tracheal epithelium was studied, in rabbits, following an open burn on a limited area of the trachea. Usually, the integrity of the epithelial stratum is restored within 7 days, and the ("flittering") epithelial covering is restored in 15 days.

W. F. F.

Mechanical methods of auscultation. G. LANDES (Klin. Woch., 1939, 18, 1022—1024).—Sound spectra of breath sounds co-ordinating frequency and amplitude were obtained with octave sieves; they give more detailed information than ordinary sound pictures. Subjective sound spectra were also produced, showing a marked difference as compared with objective spectra caused by the arrangement of the human ear with its law of logarithmic stimulation.

E. M. J.

Thoracic window for observation of the lung in living animal. R. J. TERRY (Science, 1939,

90, 43—44).—The construction and insertion of the window are described.

W. F. F.

Pathogenesis of bronchial asthma. M. HOCHREIN and G. T. DINISCHIOTU (Z. Kreislaufforsch., 1939, 31, 466—487).—An attempt to explain the attack of bronchial asthma as a result of pulmonary congestion.

G. SCH.

Reflex regulation of breathing. O. SPRENGER (Z. Kreislaufforsch., 1939, 31, 574—575).—In dogs or cats, the aorta was clamped just above the bifurcation. The release of the clamp after 10 min. causes increased breathing. This effect is abolished by previous section of both vagi and denervation of both carotid sinuses. It is abolished for an hr. by the injection of cocaine into the vagi and the tissues surrounding the carotid sinus. Section of vagi alone or denervation of the carotid sinus alone does not abolish this effect.

G. SCH.

Respiratory arrhythmia in the adipose. G. SCHLÖMKA and W. RÖSSEL (Z. Kreislaufforsch., 1939, 31, 557—569).—Respiratory arrhythmia in the adipose is rather higher than in comparable persons of normal wt.

G. SCH.

Existence of respiratory neurohormone [mode of action of acetylcholine on breathing]. T. KOPPANYI and C. R. LINEGAR (Science, 1939, 90, 141—142).—Respiratory stimulation in cats and dogs following acetylcholine injections depends on an intact carotid body. The active principle is a sympathin liberated at nerve terminations following stimulation of sympathetic ganglia by acetylcholine.

W. F. F.

Phrenic nerve and diaphragm. A. CARDIN (Arch. Sci. biol., Napoli, 1939, 25, 51—88).—The phrenic nerve is formed, both in man and dog, by 3 spinal roots which preserve their independence throughout their course. Afferent impulses in the phrenic control the tonus and extent of the respiratory movements of the nose. Both expiratory and inspiratory action currents have been obtained from the peripheral end of the 2nd phrenic root (curarised or chloralosed rabbit) when the amount of air in the lungs is subjected to sudden changes.

S. O.

Significance of static-elastic forces of the thorax for respiratory movements. A. KLISIECKI and M. NIEDBAL (Acta Biol. Exp. [Warsaw], 1939, 12, 271—276).—Pairs of ribs in connexion with the sternum were isolated in living and dead dogs. The intercostal space decreases by 0.8 mm. after cutting the external intercostal muscles. It increases by 2—3 mm. after cutting the internal intercostal and transverse thoracic muscles. A table shows the diminution of the chest circumference after cutting various abdominal muscles and its increase after section of accessory thoracic inspiratory muscles. The inspiratory muscles exert a force of 1.7 kg., the expiratory muscles 0.9 kg., in the resting dog.

A. S.

Action of anæmic decerebration on movements and tone of respiratory muscles. M. MONNIER (Verh. Schweiz. Physiol., 1939, 14th Meeting, 22—23).—Both common carotids and the basilar artery at the oral third of the pons were ligatured. Ligature

of the carotids alone had no effect on breathing. Additional ligation of the basilar artery diminished the rate of breathing and produced apnoea.

A. S.

Action of sea baths on respiratory quotient. H. ROEPER (*Z. ges. exp. Med.*, 1939, **106**, 139—153).—The R.Q. is lowered by bathing in sea-water.

A. S.

Spectroscopic method for determination of oxygen saturation in whole blood. F. G. HALL (*J. Biol. Chem.*, 1939, **130**, 573—577).—The method and a special tonometer and the manner in which blood is equilibrated in it are described. A complete O_2 dissociation curve using 1 to 2 c.c. of whole blood can be determined. The results compare favourably with those obtained by Van Slyke's method except that at high saturations the spectroscopic method gives slightly lower values. This may be due to a difference in transparency between whole blood and the standard hæmoglobin solution in the spectrophotometer.

J. N. A.

Affinity to oxygen of hæmolyzed blood of human foetus. I. I. LICHNITZKAJA and M. G. SACHS (*Bull. Biol. Méd. exp.*, U.R.S.S., 1938, **5**, 320—324).—Maternal hæmolyzed blood has a greater affinity to O_2 than foetal blood. The affinity decreases with increasing concentration of hæmoglobin.

A. S.

Changes of dissociation curve of oxyhæmoglobin of human foetus during development. M. G. SACHS and I. I. LICHNITZKAJA (*Bull. Biol. Méd. exp.*, U.R.S.S., 1938, **5**, 523—525).—The dissociation curve of oxyhæmoglobin of human foetus 16—36 weeks of age shows complete saturation with O_2 at a partial pressure of O_2 of 45—55 mm. Hg.

A. S.

Health and nutrition of high Andean Indians. C. W. LIEB (*Amer. J. digest. Dis.*, 1938, **5**, 432).

C. J. C. B.

Last thousand feet on Everest. Y. HENDERSON (*Nature*, 1939, **143**, 921—923).—A review.

W. F. F.

Use of oxygen on Mt. Everest expedition, 1938. P. LLOYD (*Nature*, 1939, **143**, 961—963).—A brief account of experiences with open- and closed-circuit O_2 equipment at altitudes up to 27,000 ft. The open-circuit apparatus had only a slight effect on climbing speed up to 26,000 ft., but its use greatly reduced strain and fatigue. Above 26,000 ft. climbing speed was increased more noticeably. The closed-circuit apparatus was unsatisfactory for unknown reasons.

W. F. F.

Reactions of acclimatisation and of non-adaptation [at high altitudes]. M. PIERY and J. ENSELME (*Nature*, 1939, **144**, 731—733).—In rabbits and geese acclimatisation reactions were studied for 6 months on the Jungfrauoch at 3500 m. The changes observed were: congestion of the lungs, increase in Fe in liver and decrease in muscle, polypnoea, and fibrosis of the heart.

W. F. F.

Last thousand feet on Everest: possible bacterial factor. J. A. CAMPBELL (*Nature*, 1939, **144**, 113—114).—Feeding experiments with rats under conditions of lowered O_2 pressure show that toxic substances from certain foodstuffs can accumulate in

the gut and lower the animal's resistance to anoxia. Foodstuffs producing these toxic substances are: casein, egg-albumin, meat, and fish, also histidine, cystine, and arginine. Resistance to O_2 lack is increased by diets containing carrots, parsnips, beet-roots, apples, bananas, also zein, gelatin; starch, glucose, fat, and vitamins do not affect resistance at all.

W. F. F.

Anoxæmia and apnoea. L. BINET, M. V. STRUMZA, and D. VOGHEL (*J. Physiol. Path. gén.*, 1939, **37**, 507—523).—In experiments on 143 dogs under chloralose anaesthesia the inspired O_2 tension was reduced, corresponding with various altitudes. There was no parallel between the degree of anoxæmia and the fall of plasma- CO_2 ; O_2 lack set up hyperventilation, the intensity of which was regulated by the state of the respiratory centre. Apnoea at high altitudes was not due to fall of blood- CO_2 and alkali reserve since it occurred both when they were not diminished and when the alkali reserve had fallen to 3 vol.-%. Re-establishment of alkali reserve did not prevent respiratory arrest and death nor did addition of 7.5% CO_2 to the O_2 from inspired air; in the latter case the total CO_2 of the plasma was maintained but death followed. Artificial respiration with CO_2 -air mixtures was not more efficient than with ordinary air; injection of $NaHCO_3$ was valueless and caused cardiac arrest. Mountain sickness is due primarily to O_2 want; the fall of plasma- CO_2 is secondary to the hyperventilation set up.

C. A. A.

Effects of insulin hypoglycæmia on blood pressure response to oxygen deficiency in man. S. H. KRAINES and E. GELLHORN (*Amer. J. Psychiat.*, 1939, **95**, 1067—1075).—In schizophrenic patients the rise in blood pressure on inhalation of 8.1% or 8.5% O_2 is increased during insulin hypoglycæmia, a finding similar to that previously obtained with narcotised dogs (*J. Neurophysiol.*, 1938, **1**, 301). The increase becomes marked when the blood-sugar is below 50 mg.-%.

G. D. G.

Effect of temperature of water on apnoea in immersed ducks. G. PESTELLINI (*Boll. Soc. ital. Biol. sperim.*, 1939, **14**, 589—591).—Apnoea occurs immediately on immersion of the head under water at 14—27° (winter) or 14—33° (summer). Above these ranges, there is a range ("indifferent thermal zone") of 10° over which apnoea does not occur, whilst apnoea is again evident at 45—46°.

F. O. H.

Respiration in atmospheres with high oxygen content. L. BINET, M. BOCHET, and A. BRYSKIER (*J. Physiol. Path. gén.*, 1939, **37**, 524—535).—Guinea-pigs, mice, and pigeons breathing 70—100% O_2 showed a large rise in red blood cells after an initial fall, an increase in glutathione in the tissues, a rise of blood-urea and -uric acid, and a slowing of respiration. They survived several days and congestion of all organs and leucocytosis in the lungs were found at death. Below 60% O_2 the changes were less marked and at 40% hardly apparent.

C. A. A.

100% oxygen. W. M. BOOTHBY, C. W. MAYO, and W. R. LOVELACE (*J. Amer. Med. Assoc.*, 1939, **113**, 477—482).—The advantages of 100% O_2 administra-

tion in various conditions are discussed. There was no pulmonary irritation after 2 days' continuous use.

C. A. K.

Free gases in blood and tissues during rapid decompression. G. SCHUBERT and A. GRÜNER (Klin. Woch., 1939, 18, 988—990).—Rats subjected to rapid decompression, *i.e.*, 70 mm. Hg in less than 1 min., survived when instantly brought back to normal atm. pressure. Otherwise increasing pulmonary atelectases and ruptured vessels caused death. Rapid decompression to less than 60 mm. Hg was never tolerated as a large vol. of free gas appeared in addition to a total atelectasis; the gases observed included O₂, CO₂, and water vapour. Fulminating subcutaneous emphysema developed in the traumatised areas.

E. M. J.

Unusual neuropsychiatric sequelæ of carbon monoxide poisoning. N. ROTH and M. HERMAN (Amer. J. Psychiat., 1939, 95, 1359—1363).—The patient showed amnesia, confusion, motor aphasia, complete anosmia, and impairment of taste perception. 18 days after the exposure to CO he had recovered from these last three sequelæ. G. D. G.

Pneumothorax gases. C. B. WELD (Proc. Nova Scotian Inst. Sci., 1938—9, 20, 1—12).—Gas analyses were carried out on the pneumothorax gases of 15 dogs and 62 human beings following artificial pneumothorax production. In the equilibrium condition in otherwise normal dogs 6% of CO₂ and 10% of O₂ is found. In man (patients) a wider variation is found and the O₂ is usually less than 5% and even less than 1% in many instances; the CO₂ is usually above 7%. Pleural inflammation in dogs is accompanied by approximation of pleural gas to a composition resembling that of normal man with pneumothorax.

W. F. F.

(viii) MUSCLE.

Hypertrophy of the diaphragm following exercise. L. H. STRAUSS (Z. ges. exp. Med., 1939, 106, 119—131).—Exercise over 7—9 weeks produces hypertrophy of the heart and of the diaphragm in rabbits.

A. S.

Localisation of electrolytes in muscle. E. J. CONWAY, F. KANE, P. BOYLE, and H. O'REILLY (Nature, 1939, 144, 752—753).—The vol. of the free interspaces within freshly excised sartorius muscle is 9 ml. per 100 g. as measured by an inulin method. The diffusion of K⁺ and Na⁺ into and out of muscle was studied.

W. F. F.

Polarisation currents in frog muscles. S. SZABUNIEWICZ (Acta Biol. Exp. [Warsaw], 1938, 12, 211—228).—Various frog muscles were bathed for 10 sec. in a 1% HgCl₂ solution and washed in Ringer's solution. The p.d. from different points of the surface were led off with Ag—AgCl electrodes. Muscles of the trunk show only small p.d. The p.d. from the distal towards the proximal end of the muscles of foot, hand, forearm, and hind leg increases by 2.5—4.0 mv. per mm. The muscles of the thigh show an ascending current in the lower half and a descending current in the upper half. The p.d. on

the surface of polarised muscles cannot be explained as injury currents.

A. S.

Electronegativity of injured parts in skeletal muscles. B. SZABUNIEWICZ (Acta Biol. Exp. [Warsaw], 1939, 12, 277—296).—The electronegativity of injured skeletal muscle is attributed to polarisation of muscle fibres adjacent to the site of injury. Pre-contraction and contraction polarisation are distinguished. There is no distinct border line between electronegativity of the cut end of a muscle and muscle surface. The electrical potential on the non-injured surface falls off gradually towards the injured part.

A. S.

Atrophy and regeneration of denervated muscle. H. CHOR, D. CLEVELAND, H. A. DAVENPORT, R. E. DOLKART, and G. BEARD (J. Amer. Med. Assoc., 1939, 113, 1029—1033).—The sciatic nerve in monkeys was cut and sutured and the effect of physical therapy on recovery was studied. Atrophy and degeneration of the denervated gastrocnemius-soleus muscles progressed for 6 weeks despite massage, passive movements, or electrical stimulation. The degree of nerve regeneration is not influenced by physical therapy, but restoration of muscle is helped by massage and passive movement, which are best given after 4 weeks' immobilisation in splints.

C. A. K.

Physiological properties of nerveless region of skeletal muscle. I. BERITOV (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 592—596).—The properties investigated were electrical response, refractoriness, tetanus response, and response to stimuli at different frequencies. No differences from general muscle properties of the frog were found.

W. F. F.

Origin of acetylcholine contracture. I. BERITOV (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 597—601).—Acetylcholine contracture of frog's muscle takes place through the excitation of the neuromuscular junction.

W. F. F.

Effect of nicotine and acetylcholine on fatigue curve of skeletal muscle of frog. E. S. PEREGUDOVA (Bull. Biol. Méd. exp., U.R.S.S., 1938, 5, 485—486).—Application of 2—3 µg. of nicotine or of acetylcholine (1:10⁹) to the surface of a frog's gastrocnemius, fatigued by rhythmic motor nerve stimulation (40 per sec.), has a marked anti-fatigue action.

A. S.

Electric phenomena in eserine-poisoned frog muscle. A. G. GINEZINSKI and N. J. MICHELSON (Bull. Biol. Méd. exp., U.R.S.S., 1938, 5, 386—388).—Marked electronegativity was observed in a frog's gastrocnemius muscle, poisoned with eserine, after stimulation of its motor nerve with shocks (25—100 per sec.). The negativity gradually disappears after cessation of stimulation.

A. S.

Action of eserine on skeletal muscle of tortoise. A. G. GINEZINSKI and N. A. ITINA (Bull. Biol. Méd. exp., U.R.S.S., 1938, 5, 382—385).—The response of the retractor capitis muscle of the tortoise to maximal motor nerve stimulation at various rates was studied after immersing the prep. in a solution

of 0.01—0.02 mg. of eserine. The relaxation of the muscle following the twitch is delayed. The action potential is increased in magnitude after eserine treatment; frequently, single stimuli were transformed into rhythmic discharges. The action of acetylcholine is attributed to depolarisation of the neuro-muscular junction. A. S.

Effect of eserine on skeletal muscles of frog. A. G. GINEZINSKI and N. J. MICHELSON (Bull. Acad. Sci. U.R.S.S., 1938, Sér. Méd., 1311—1340).—The response of frog's abdominal rectus, sartorius, and gastrocnemius muscles to supramax. motor nerve stimulation was studied after bathing the preps. in solutions containing 0.1—0.25 mg. of eserine for periods up to 3 hr. Evidence for the release of acetylcholine at the nerve terminals is presented. A. S.

Influence of sodium fluoride, sodium maleate, glutamic acid, and glyceraldehyde on muscular activity. A. M. RJABINOVSKAJA (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 958—961).—The compounds tested modify the excitability of skeletal muscle as judged by experiments with the frog's gastrocnemius muscle. W. F. F.

Myasthenia gravis and hyperthyroidism. M. W. THORNER (Arch. intern. Med., 1939, 64, 330—335).—In a case of myasthenia gravis the onset of hyperthyroid symptoms was associated with lessening of the myasthenic symptoms. Thyroid administration to another patient had a similar effect. C. A. K.

Diagnosis and treatment of myasthenia gravis. H. R. VIETS and R. S. SCHWAB (J. Amer. Med. Assoc., 1939, 113, 559—563).—A study of 44 patients with myasthenia gravis suggests that oral prostigmine hydrobromide + ephedrine sulphate, KCl, or guanidine is the best treatment. C. A. K.

Guanidine in myasthenia gravis. A. S. MINOT, K. DODD, and S. S. RIVEN (J. Amer. Med. Assoc., 1939, 113, 553—559).—Guanidine hydrochloride, intravenously or by mouth, produced a marked and well sustained improvement in muscular function in 5 cases of myasthenia gravis. Myasthenic patients tolerate larger doses than normal subjects before hyperguanidinemia occurs. Toxic symptoms (with doses of 25—50 mg. per kg. daily) were anorexia, nervousness, occasional vomiting, and increased peristalsis. The mode of action of guanidine is unknown. C. A. K.

(ix) NERVOUS SYSTEM.

Use of the Horsley-Clarke instrument on rat. G. CLARK (Science, 1939, 90, 92). W. F. F.

Plasticity of central nervous systems. N. RASHEVSKY (Bull. Math. Biophys., U.S.A., 1939, 1, 93—94).—A mathematical note. W. F. F.

So-called "colonial nervous system" in Bryozoa. S. HILLER (Nature, 1939, 143, 1069—1070).—In *Membranipora crustulenta* and *M. pilosa* a nerve plexus with small cells and long fibres is described. Each nerve plexus is connected with the central nerve ganglion and with similar plexuses of neighbouring zoecia. W. F. F.

Vitamins and nervous system. A. AUSTREGESILO (Confinia neurol., 1939, 2, 185—214).—A review. (B.) A. S.

Discussion on neurological complications of pregnancy. W. R. RUSSELL, H. L. SHEEHAN, R. IRONSIDE, H. GARLAND, H. M. SINCLAIR, P. MARTIN (Proc. Roy. Soc. Med., 1939, 32, 581—600).—Complications are cerebral vascular accidents, spinal affections particularly myelitis, peripheral neuritis, polyneuritis, and the neurological diseases, such as disseminated sclerosis, Parkinsonism, epilepsy, myasthenia gravis, and myotonia, which may be affected by pregnancy. Even the better-known complications are uncommon. The differential diagnosis of the cerebral disturbances of toxæmias and the conditions which simulate them are discussed together with the possibility of transmission of disease to the offspring, aggravation of the disease by pregnancy, and the effect on the latter of the neurological disorder. The vitamin- B_1 requirements in pregnancy are also dealt with. W. J. G.

In vitro cultivation of peripheral nerve particles. N. G. CHLOPIN (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 175—177).—Vagus nerve explants were used from rabbits and pigs and cultivated *in vitro*. The growth of Schwann's cells was specially studied. W. F. F.

Action potentials recorded from inside a nerve fibre. A. L. HODGKIN and A. F. HUXLEY (Nature, 1939, 144, 710—711).—A p.d. of 50 mv. was recorded between the inside and outside of the resting fibre of giant axons of *Loligo forbesi*. The action potential was 90 mv. at 20° in abs. magnitude. W. F. F.

Mathematical theory of excitation. A. S. HOUSEHOLDER (Bull. Math. Biophys., U.S.A., 1939, 1, 129—141).—The general two-factor nerve-excitation theory involving linear differential equations is discussed. W. F. F.

Relation between rhythmicity of nervous response and resonance. A. M. MONNIER and G. COPPÉE (Arch. internat. Physiol., 1939, 48, 129—180).—A study of rhythmic response from nerve and of the types of stimulation capable of exciting it. W. B.

Rôle of dietary choline in neurohumour production [response to vagal stimulation]. D. Y. SOLANDT and C. H. BEST (Nature, 1939, 144, 376).—Deficient vagal response to stimulation was found in rats receiving a diet containing a low level of choline. W. F. F.

Effect of insulin on chronaxie of snail's foot. R. CAHEN (Compt. rend., 1939, 209, 447—448).—Insulin (2 units) increases the chronaxie and rheobase of the snail's foot by 200% in 15 min.; smaller doses give smaller increases. Both the chronaxie and rheobase return to their original vals. in about 1 hr. but the vals. are again increased by washing the muscle. The insulin is not destroyed and the muscle reacts to an additional amount of the hormone. The amount of fluid absorbed by the muscle is less in presence of insulin than with Ringer's solution alone. J. L. D.

Effect of local anaesthetics on nerve chronaxie. J. RÉGNIER and A. QUEVAUVILLER (Arch. exp. Path. Pharm., 1939, 193, 48—78).—A comprehensive survey. Local anaesthetics produce a temporary fall of chronaxie the extent of which is a function of the concn. Irritability may be evaluated by means of the characteristic $1/[R \times (2I)^2 \times \tau]$. The action of percaine is fundamentally different from that of the other local anaesthetics in its effect on chronaxie and in the irreversibility of its action. A precision chronaximeter devised by Lapique is described.

H. O. S.

Sensory components of phrenic nerve of cat. J. C. HINSEY, K. HARE, and R. A. PHILLIPS (Proc. Soc. Exp. Biol. Med., 1939, 41, 411—414).—After cutting the anterior roots from 2—8 cervical, and removing the sympathetic chains, the sensory fibres of the phrenics remain undegenerated, the majority being non-medullated.

V. J. W.

Traumatic rupture of spleen in children, with special reference to left shoulder pain. N. A. ANDERSON (J. Pediat., 1939, 15, 535—539).—14 of 90 children showed left shoulder pain.

C. J. C. B.

Reflex scoliosis in diseases of urinary tract. F. DITTMAR (Dtsch. Arch. klin. Med., 1939, 184, 249—285).—93 patients, suffering from acute or chronic diseases of kidney and ureter, showed scoliosis of the lumbar spine. The degree of scoliosis depended on the severity of the disease; it disappeared when the patient recovered. The phenomenon is attributed to a visceromotor reflex, affecting the skeletal muscles innervated from Th₈—L₅.

A. S.

Mathematical biophysics of central nervous system. H. D. LANDAHL (Bull. Math. Biophys., U.S.A., 1939, 1, 95—118).—A mathematical treatment of neural networks with various properties of impulse transmission.

W. F. F.

Liberation of potassium by acetylcholine in the central nervous system. W. DULIÈRE and O. LOEWI (Nature, 1939, 144, 244).—Neither eserine alone nor acetylcholine alone affects the content of free K in the central nervous system of *Rana esculenta*. After eserisation for 30 min., acetylcholine increases the free K about 20%. Prior treatment with atropine prevents the acetylcholine effect.

W. F. F.

Morphology of synapse in cat's spinal cord. M. L. BARR (J. Anat., 1939, 74, 1—11).—Cajal's reduced AgNO₃ technique (modification 4) gave fairly const. impregnation. Terminations of axons as end bulbs are distributed over the surface of the cell body and proximal portion of the dendrites at the rate of 16 per 100 sq. μ , or several thousand on a single large motor neurone. Many end bulbs are derived from one axon, thus providing a large no. of small synapses; over one third of the cell membrane may be used in this way to provide the synaptic area, leaving the intervening cell membrane free for the interchange of products of cellular metabolism.

E. E. H.

The synapse. (A) Axons as samples of nervous tissue. H. S. GASSER. (B) Initiation of impulses in axons. J. ERLANGER. (C) Synaptic

mechanisms in sympathetic ganglia. D. W. BRONK. (D) Transmission of impulses through cranial motor nuclei. R. LORENTE DE NÓ. (E) Problems of synaptic function. A. FORBES (J. Neurophysiol., 1939, 2, 361—369, 370—379, 380—401, 402—464, 465—472).—A symposium.

S. CR.

Retroactive facilitation in tactile stimulation. H. PIÉRON and J. SEGAL (J. Neurophysiol., 1939, 2, 178—191; cf. A., 1938, III, 795).

S. CR.

Preparations from spinal cord in laboratory diagnosis of rabies. R. A. GREENE and E. L. BREAZEALE (J. Lab. clin. Med., 1939, 25, 102).—In an unnumbered series preps. from the spinal cord and from Ammon's horn agreed perfectly with regard to presence or absence of Negri bodies.

C. J. C. B.

Cell structure of mammillary body in mammals and in man. J. ROSE (J. Anat., 1939, 16, 91—115).—In all mammals 3 groups of nuclei can be distinguished. The dorsal group is well developed in lower mammals, less so in man, and is probably not connected with the thalamus. The lateral group bears a fairly const. relation to the vol. of the mammillary body and to the hypothalamus, and is not connected with the thalamus. The medial group increases in vol. relatively in higher mammals in association with an increase in that of the thalamus.

E. E. H.

Associated ocular movements and gaze paralysis. A. KESTENBAUM (Confinia neurol., 1939, 2, 121—147).—Five types of associated ocular movements are distinguished: voluntary movements, movements following optical or sensory stimulation, movements following rotation of the head, and vestibular compensatory reactions. An analysis of optokinetic and vestibular nystagmus is given and various types of gaze paralysis are described.

A. S.

Pupillo-motor activity of diencephalon and mesencephalon in non-anaesthetised cat. E. CLAES (Arch. internat. Physiol., 1939, 48, 261—280).—The reactions obtained from different parts of these structures on electrical stimulation are described.

W. BU.

Time and place of experimental myelin degeneration in optic pathways. R. G. MEADER (Proc. K. Akad. Wetensch. Amsterdam, 1939, 42, 526—532).—In rabbits observations were made on the degeneration of axis cylinder and myelin sheath of the optic pathways following enucleation of the eye. Marchi degeneration granules appear after 96 hr., but the full typical picture takes at least 280 hr. to develop. The degenerative process proceeds at different rates in different fibres, more quickly in crossed and less quickly in uncrossed fibres.

W. F. F.

Central visual system. Evidence against bilateral representation through splenium of corpus callosum. O. R. HYNDMAN (Arch. Neurol. Psychiat., Chicago, 1939, 42, 735—742).—In man full macular vision was retained after resecting the right occipital lobe to the tip of the splenium of the corpus callosum and dividing the corpus callosum to a point 5.7 cm. from its posterior tip. Central vision

is represented in part anterior to the accepted visual cortex and is not represented bilaterally.

W. M. H.

Electro-encephalograms of psychotic patients.

P. A. DAVIS and H. DAVIS (Amer. J. Psychiat., 1939, 95, 1007—1025).—The fundamental patterns of the electro-encephalograms of 232 mental hospital patients were indistinguishable from those of 500 normal controls, but with a large proportion of the former abnormal waves interrupted the fundamental wave pattern.

G. D. G.

Pre-linguistic sign behaviour in chimpanzees.

R. M. YERKES and H. W. NISSEN (Science, 1939, 89, 585—587).—Behaviour experiments are described involving the choice of a box containing food from alternatives.

W. F. F.

Experimental investigation of motor cortex and its connexions in the phalanger, *Trichosurus vulpecula*.

F. GOLDBY (J. Anat., 1939, 16, 12—33).—An electrically excitable area, with a distinct cellular pattern, is present in the anterior 3rd of the hemisphere. Its stimulation causes movements of the head, neck, forelimbs, hindlimbs, and possibly trunk, whilst its destruction results in transient motor loss in heterolateral limbs. Degeneration experiments show that the cortico-spinal tract arising from this motor cortex decussates completely at the hinder end of the medulla, and extends in the posterior column to the midthoracic level of the cord; many of the fibres are non-myelinated. Fronto-pontine fibres are scanty or non-myelinated.

E. E. H.

Biochemistry of manic-depressive psychosis.

R. A. MCFARLAND and H. GOLDSTEIN (Amer. J. Psychiat., 1939, 96, 21—58).—A review.

G. D. G.

Cell minerals in amaurotic idiocy, tuberous sclerosis, and related conditions, studied by micro-incineration and spectroscopy.

L. ALEXANDER and A. MYERSON (Amer. J. Psychiat., 1939, 96, 77—86).—Micro-incineration and spectroscopy reveals that in amaurotic idiocy (Tay-Sachs disease), as in other degenerative conditions, the cytoplasm of the diseased ganglion cells undergoes demineralisation with decrease of Ca and P; in tuberous sclerosis, as in other blastomatous or neoplastic disease, it undergoes hypermineralisation with increase of Ca. The glial cells in both diseases are hypermineralised. The tumour nodules in periventricular spongioblastomatous hamartoma (probably an attenuated form of tuberous sclerosis) show gross hypermineralisation, like all tumour tissue. The ash of the brain tissue in Mongolian idiocy appears normal.

G. D. G.

Finger agnosia in children.

A. STRAUSS and H. WERNER (Amer. J. Psychiat., 1939, 95, 1215—1225).—Finger agnosia (inability to recognise, indicate, name, or choose fingers) occurs in children as well as in adults.

G. D. G.

Cerebral cortical calcification simulating Pick's disease.

E. KAHN, E. G. LION, and H. M. ZIMMERMAN (Amer. J. Psychiat., 1939, 95, 1027—1033).—In a male aged 56 extensive symmetrical calcification was found in the cerebral cortex, particularly in the frontal and temporal lobes, with less involvement of the parietal and occipital regions.

Cortical tissue obtained by biopsy showed calcification, Fe pigment deposition in the capillaries, reduction in the no. of ganglion cells, and slight proliferation of the glia.

G. D. G.

Cortical oculomotor centres in unanæsthetised cat.

E. CLAES (Arch. internat. Physiol., 1939, 48, 238—260).—The effect on eye movements of electrical stimulation of varied intensity of the anterior and posterior cortical oculomotor centres was investigated in the isolated brain (Bremer) of unanæsthetised cats. The two anterior centres, which appeared to be functionally independent, caused conjugate deviation of the eyes and head away from the side stimulated. This was replaced by centralisation of the eyes, if deviated, when the posterior nerve roots containing afferents from the cervical muscles were cut. Stimulation of the posterior cortical oculomotor centres gave conjugate deviation of the eyes to the opposite side. The anterior centres dominated the posterior on simultaneous stimulation. Cocainisation of the visual cortex diminishes the response from the oculomotor cortical areas.

W. BU.

Pharmacological shock treatment of schizophrenia.

J. R. ROSS (Amer. J. Psychiat., 1939, 95, 769—779).—In the New York State hospitals, of 1039 untreated schizophrenics, 3.5% recovered, 11.2% were much improved, and 7.4% were improved. For 1356 schizophrenics treated with insulin, the figures were 14.2%, 20.6%, and 26.3%, whilst with 523 cardiazol-treated schizophrenics they were 4.4%, 9.8%, and 32.1%. Although recovery and improvement rates decrease with increasing duration of the illness, insulin treatment where the duration is over 2 years is justified by the results.

G. D. G.

Histology of epilepsy [following cardiazol].

A. MEYER (J. Ment. Sci., 1939, 85, 927—931).—Rabbits and guinea-pigs were killed at various stages of the cardiazol convulsion and their brains examined. No general or circumscribed anæmia was found, but there was marked vasodilatation and irregularity of the vascular pattern in the later clonic stage.

G. D. G.

Mechanisms of convulsive phenomena, with reference to effects of vasodilator drugs.

D. J. WATTERSON (J. Ment. Sci., 1939, 85, 904—924).—In the guinea-pig, subcutaneous carbamylcholine (0.003—0.1375 mg.) had no effect on the convulsive action of intramuscular cardiazol (60—70 mg. per kg.). Acetyl- β -methylcholine (0.5—1.0 mg.) had little effect on the action of 60 and 65 mg. per kg. of cardiazol, but markedly decreased the % of animals showing tonic convulsions following 70 mg. per kg. of cardiazol. Amyl nitrite by inhalation increased the % of animals showing tonic convulsions after 60 mg. per kg. of cardiazol.

G. D. G.

Histopathologic changes in brain following experimental injections of metrazol.

E. LIEBERT and A. WEIL (Arch. Neurol. Psychiat., Chicago, 1939, 42, 690—699).—Repeated injections of metrazol cause neuronal changes with hyperplasia and hypertrophy of the glia cells, especially in the corpus striatum and hippocampus.

W. M. H.

Metrazol shock treatment; pharmacological and biochemical studies. F. C. REDLICH (Amer. J. Psychiat., 1939, 96, 193—204).—In humans the serum-Ca and -K were unaltered after metrazol convulsions; serum-Cl was slightly increased. Increase in blood-sugar may be due to increased adrenaline secretion. Blood sedimentation rate was lowered. The min. convulsive dose of metrazol was decreased by CO₂, insulin, and ephedrine, and to a smaller extent by adrenaline and pituitrin. Strychnine, caffeine, and theophylline had no such effect. Certain barbiturates had a greater antagonistic effect towards metrazol than did paraldehyde or chloral hydrate, whilst NaBr had none. In rats, previous administration of thyroxine lowered the min. convulsive dose of metrazol. G. D. G.

Disturbances of drawing in hypoglycæmia. K. GYÁRFÁS (Confinia neurol., 1939, 2, 148—160).—Disturbances of drawing were observed in schizophrenics immediately after the hypoglycæmic shock which resembled those observed in patients with parieto-occipital lesions (in cases with perceptual or aphasic disturbances) or showed regression to infantile character (in patients with mainly motor symptoms during shock). A. S.

Pathologic considerations on insulin treatment of schizophrenia. A. FERRARO and G. A. JERVIS (Amer. J. Psychiat., 1939, 96, 103—108).—Histological changes in the brains of 5 schizophrenics who died during insulin treatment are described. In most cortical nerve cells changes were observed ranging from chromatolysis and shrinkage to colliquation and formation of cellular shadows. Large areas of almost total loss of nerve cells occurred with irregular distribution. Glial proliferation was variable. There was complete "dropping out" of the nerve cells of the pyramidal layer of Ammon's horn. Proliferative changes were seen in the capillaries and small vessels of the cortex, often with obliteration of the lumen. G. D. G.

Insulin treatment in schizophrenic patients. S. KATZENBOGEN, H. HARMS, R. WILLMANS, S. BARKOFF, M. W. BRODY, and M. HAYMAN (Amer. J. Psychiat., 1939, 95, 793—798).—Unusual reactions included convulsions after recovery from hypoglycæmia, also prolonged hypoglycæmia. Remission occurred in 35% of 60 patients treated. During insulin coma changes occurred in blood-fermentable sugar, -P, -K, -amino-N, -urea, -lactic acid, -serum solids, -viscosity, and white cell count. G. D. G.

Cerebral damage in hypoglycæmia. A. B. BAKER (Amer. J. Psychiat., 1939, 96, 109—127).—From a review of the literature and his own cases (cf. A., 1939, III, 970) it is concluded that hypoglycæmia from any cause may depress cerebral function and even produce irreversible degeneration of the brain cells and tissues (nerve cell alterations, cerebral petechiæ, glial proliferation, demyelination). Protracted or permanent impairment of function or death may result. G. D. G.

Involuntary eye movements as criterion of depth of insulin coma. H. BRILL and R. F. BINZLEY (Amer. J. Psychiat., 1939, 96, 177—181).—

The sequence is approx. as follows: (1) a latent period (1—3 hr.); (2) nystagmus with slow and fast phase; occasionally lid retraction; (3) spontaneous pendular nystagmus (5—30 excursions per min.); occasionally fixed conjugate deviation; (4) cessation of all spontaneous movements and deviations; pendular nystagmus on stimulation; (5) eyes fixed in mid-position; no nystagmus on stimulation; (6) dilation of pupils during paralytic respiratory phenomena. G. D. G.

Skin and body temperature of schizophrenic and normal subjects under varying fundamental conditions. H. FREEMAN (Arch. Neurol. Psychiat., Chicago, 1939, 42, 724—734).—Exposure to external cold (15°, 20°, and 24°) results in greater cooling of the skin in schizophrenics than in normals. There are no differences on exposure to external heat (44°). W. M. H.

Effects of vitamin-B₁ in schizophrenia. L. H. CHASE (Amer. J. Psychiat., 1939, 95, 1035—1038).—Vitamin-B₁ (100 mg. daily for 6—9 weeks) caused no significant changes in the clinical condition, Stanford-Binet scores, blood pressure, pulse rate, basal metabolism, and blood-CO₂ and -glutathione in 10 male schizophrenic patients. The O₂ and lactic acid in venous blood were decreased. G. D. G.

Analogies and opposites in schizophrenia and epilepsy. H. H. JASPER, C. P. FITZPATRICK, and P. SOLOMON (Amer. J. Psychiat., 1939, 95, 835—851).—A much greater proportion of epileptics than of schizophrenics show a high % of α plus slow-wave activity in the electro-encephalogram. Normal people are intermediate between epileptics and schizophrenics. There is no antagonism between epilepsy and schizophrenia; of 82 schizophrenics 12 showed clinical signs of epilepsy, 6 had convulsions, and 12 gave brain potentials of the epileptiform type. In the schizophrenic group poor regulation of frequency and amplitude, abnormal grouping of potentials, and dissociation of the activity of homologous regions were found, but individuals differed widely. G. D. G.

Inheritance of epilepsy. W. G. LENNOX, E. L. GIBBS, and F. A. GIBBS (J. Amer. Med. Assoc., 1939, 113, 1002—1003).—Electro-encephalographic records were obtained from 138 close relations of epileptic subjects. Abnormal records were seen in 54% (as compared with 6% in a control group of subjects unrelated to epileptics). In 46 families 28% showed abnormal records in both parents and 94% showed one abnormal parent. C. A. K.

Age of onset of epilepsy. H. A. PASKIND and M. BROWN (Amer. J. Psychiat., 1939, 96, 59—64).—In 368 adult non-deteriorated persons with epilepsy, the % occurrence of the age of onset was as follows: 0—5 years, 11.7%; 6—10, 13.9; 11—15, 18.7; 16—20, 16.0; 21—25, 10.3; 26—30, 11.2; 31—40, 10.3; 41—50, 7.1; 51—60, 0.8; 61—70, 0. Comparison with figures in the literature for deteriorated patients shows that there is a tendency to a later onset in the non-deteriorated subjects. G. D. G.

Frequency of seizures of epilepsy. H. A. PASKIND and M. BROWN (Amer. J. Psychiat., 1939,

96, 65—68).—In 317 non-deteriorated epileptics the % with different frequencies of grand mal seizures were as follows: less than 1 day between seizures, 5.7; 1 day to 1 week between seizures, 8.8; 1—2 weeks, 12.0; 2—4 weeks, 25.6; 1—2 months, 12.9; 2—4 months, 20.5; 4—6 months, 6.0; 6—12 months, 2.8; over 12 months, 5.7. Comparison with figures in the literature for deteriorated hospitalised patients shows that major seizures are significantly less frequent in the non-deteriorated epileptics. G. D. G.

Constitutional differences between deteriorated and non-deteriorated patients with epilepsy. II. H. A. PASKIND and M. BROWN (*Amer. J. Psychiat.*, 1939, 95, 901—921).—Anthropometric measurements on 89 patients show that there is a difference in body size and proportions. Deteriorated patients are heavier per unit of height than non-deteriorated ones, and their trunks are wider and deeper per unit of height. G. D. G.

Sodium diphenylhydantoinate in treatment of severe cases of epilepsy. I. FROST (*J. Ment. Sci.*, 1939, 85, 976—981).—Epistaxis may be caused by this drug. Following its administration there is an increase in the amount of substances giving the creatinine colour reaction in the urine. In man Na diphenylhydantoinate does not increase the dose of cardiazol necessary to produce a fit. G. D. G.

Radiologic gastrointestinal studies in epilepsy. L. J. ROBINSON (*Amer. J. Psychiat.*, 1939, 95, 1095—1102).—14 out of 100 epileptics showed gastrointestinal abnormalities. 23 had gastrointestinal aura, but of these only 3 had gastrointestinal abnormalities; the latter are not responsible for such auras. G. D. G.

Convulsive states with evidence of brain hemiatrophy. L. CASAMAJOR and R. W. LAIDLAW (*Amer. J. Psychiat.*, 1939, 96, 165—175).—9 cases of convulsive states in children are described in which X-rays showed unilateral cerebral hypoplasia and atrophy with increase in the thickness of the skull and enlargement of the sinuses. They were of traumatic, inflammatory, and vascular origin. G. D. G.

Recent advances in surgery of autonomic nervous system. W. K. LIVINGSTONE (*Confinia neurol.*, 1939, 2, 161—183).—A review. (B.) A. S.

Epileptiform attacks in patient with tumour of carotid body. W. BIRKMEYER (*Wien. Arch. inn. Med.*, 1939, 33, 13—22).—Epileptiform convulsions with bradycardia, unconsciousness, and micturition were produced by pressure on a tumour of the carotid body in a woman. Spontaneous attacks ceased after extirpation of the tumour. A. S.

Carotid nerve and plexus. E. LUNA (*Arch. ital. Anat. Embriol.*, 1939, 42, 200—212).—The internal carotid plexus is mainly formed by amyelinated fibres but some are myelinated; some of the latter are small and have a myelin sheath only in part of their course. There are some anastomoses of the plexus fibres with somatic nerves. The plexus in one case (child of 22 days) had a single ganglion with 200 medium-sized, and many other smaller,

cells; in another case (adult) there were scattered nerve cells, either single or in small groups. S. O.

Effect of sympathetic nervous system on position and movement of vibrissæ. G. M. LIBELLI (*Boll. Soc. ital. Biol. sperim.*, 1939, 14, 580—582).—Electrical stimulation of cervical sympathetic produces movement of the whiskers (guinea-pig, rabbit). F. O. H.

Structure of commissural fibres of the sacral sympathetic nerve. S. PUSATERI, jun. (*Boll. Soc. ital. Biol. sperim.*, 1939, 14, 407—408).—The observed presence of myelinated fibres is discussed. F. O. H.

Structure of commissural fibres of the cervical sympathetic nerve in man. G. VILLA (*Boll. Soc. ital. Biol. sperim.*, 1939, 14, 369—370).—The distribution of non-myelinated and (non-preganglionic) myelinated fibres is described. F. O. H.

Mechanism of formation and destruction of peripheral chemical transmitters. C. S. KOSCHTOJANZ and R. L. MITROPOLITANSKAJA (*Compt. rend. Acad. Sci. U.R.S.S.*, 1939, 23, 955—957).—After treatment with 0.02M-glyceraldehyde the frog's heart does not slow or stop following stimulation of the vago-sympathetic nerve trunk, but accelerates owing to the action of sympathetic fibres acting alone. Further treatment with CuCl_2 solution also abolishes the sympathetic accelerator effect. W. F. F.

Effects of metrazol convulsions on cerebrospinal fluid. M. SPIEGEL-ADOLF and H. FREED (*Confinia neurol.*, 1939, 2, 228—238).—The ratio of non-electrolytes to electrolytes in c.s.f. (determined by interferometric and conductivity methods) is increased after metrazol shock treatment in schizophrenics (untreated average: 0.26; after metrazol 0.32). C.s.f. of epileptics shows a ratio of 0.32 after seizures. A. S.

Influence of particle size and hydrogen-ion concentration of gold sols on Lange test readings on paretic spinal fluids. P. K. GLASOE and C. H. SORUM (*J. Lab. clin. Med.*, 1939, 25, 1—7).—The sensitivity of Au sols in the Lange c.s.f. test for paresis increases with an increase in particle size and decreases with an increase in p_{H} . C. J. C. B.

Blood-central nervous system barrier permeability to horse serum in experimental poliomyelitis. E. H. LENNETTE and D. H. CAMPBELL (*Proc. Soc. Exp. Biol. Med.*, 1939, 41, 320—323).—Horse serum injected subcutaneously into monkeys can be detected in traces in the c.s.f. of infected monkeys, but not in controls, by precipitin reactions with rabbit anti-serum. V. J. W.

(x) SENSE ORGANS.

Ascorbic acid content of the eyes in various animal species. R. VLADESCO and H. STEFANESCO (*Compt. rend. Soc. Biol.*, 1939, 132, 169—171).—The ascorbic acid content of aq. humour and lens has been determined (by Tillmans' method) in various ruminants, in the horse, pig, and in two human eyes and found to be relatively high in all these species. H. L.

Clinical and experimental study of interstitial keratitis. J. V. KLAUDER, E. R. GROSS, and H. F. ROBERTSON (J. invest. Dermatol., 1939, 2, 157—173).—Cornea removed from patients with interstitial keratitis failed to show *Spirochaeta pallida*. Rabbits were injected intraocularly with horse serum. The ocular response to second injections of horse serum was studied by slit lamp microscopy. There was no definite evidence of an allergic reaction. Pericorneal congestion and contraction of the pupil, however, occurred. Cutaneous tests on patients with interstitial keratitis, with cornea of the same patient, and also cornea of a syphilitic fetus were negative. It was not possible to produce interstitial keratitis in syphilitic rabbits by repeatedly traumatizing the cornea. The slit lamp picture of interstitial keratitis was produced in some normal and in some syphilitic rabbits by intracorneal injections of horse serum. This was attributed to trauma. The cornea is a poor conductor of heat. When a temp. of 54.4° was applied to the anterior surface of the cornea, the max. temp. of the posterior surface behind the thermophore was 43.9°. The max. temp. the cornea will tolerate with safety is 54.4° for 1 min. The temp. required to kill *S. pallida* was at least 48.9° for 2 min. No As was present in the cornea after successive instillation of a 1:600 dilution of nearsphenamine into the conjunctival sac. Following 6 consecutive daily intravenous injections of nearsphenamine (30 mg. per kg. body-wt.) 0.04 mg. of As was present in each cornea. Patients with interstitial keratitis were treated without effect with repeated instillation of 9 c.c. of 1:600 dilution of nearsphenamine maintained in the sac for 20 min. C. J. C. B.

Pupil reaction during time of ingestion. D. GRANAAT (Arch. Néerl. Physiol., 1939, 24, 25—52).—Pupil diameters were measured by moving a luminous strip towards the eye until its image in the cornea was of the same size as the pupil. Dilatation of the pupil occurred when the dogs (and one cat) seized food which they liked and later when they saw such food. The reaction was first demonstrable in puppies 2½ months old. It could be checked by light narcosis or by conditions which distracted the animal's attention. It was also checked by combining unpleasant odours with the food. Under these conditions a much slower dilatation occurred during the period when the animal was reacting to the odour. K. T.

Changes in retinal excitability due to polarization: relation between the processes in retina and nerve. R. GRANIT and T. HELME (J. Neurophysiol., 1939, 2, 556—565).—The electroretinogram and the impulses from the optic nerve were recorded during the passage of a galvanic current across the retina. Both the electroretinogram and the optic nerve impulses were augmented when the cathode was inside the eye but they were diminished when the current was reversed. The effect was the same on the negative components left after treating the eye with KCl. Antidromic impulses through the optic nerve had no effect on the electroretinogram. There is practically no nerve-retinal interval during the off-effects on ceasing to illuminate the eye: the off-

discharge in the nerve precedes the main off-effect in the retina. K. T.

Temperature and critical illumination for reaction to flickering light. V. *Xiphophorus*, *Platyocentrus*, and their hybrids. W. J. CROZIER and E. WOLF (J. Gen. Physiol., 1939, 23, 143—163).—The relation between crit. frequency of flicker and illumination for the F_1 hybrids is approx. intermediate between the relations found for the parent teleosts. Results are analysed thermodynamically. K. T.

Flicker response contour for the frog. W. J. CROZIER and E. WOLF (J. Gen. Physiol., 1939, 23, 229—237).—In the curve relating crit. frequency of flicker and illumination for *Rana pipiens*, the "rod" portion of the curve is very small. K. T.

Central neural organisation of optic functions related to minimum visible acuity. K. U. SMITH and J. WARKENTIN (J. Genet. Psychol., 1939, 55, 177—194).—Removal of the striate areas of the cortex in 6 cats produced no marked defects in acuity, but resulted in failure to respond to lines widely separated in the field of vision, using the rotating-drum method. It is concluded that optic pursuit movements in response to single or isolated patterns are mediated centrally, but that the response to closely spaced patterns may be mediated sub-cortically in the absence of the cortex. Complete bilateral removal of the striate cortex in the cat produces limited deficiencies in pattern vision by abolishing focal vision and fixation of isolated patterns. It is concluded that cortical and sub-cortical lesions differ quantitatively, not qualitatively, in the mediation of visual functions based on pattern stimulation. K. J. W. C.

Effects of intermittent photic stimulation. S. H. BARTLEY (J. Exp. Psychol., 1939, 25, 462—480).—The subjective effects of intermittent stimulation were investigated. The Brücke phenomenon does not appear with an illuminated surround. K. J. W. C.

Group colour vision tests. C. BERENS and L. STEIN (J. Amer. Med. Assoc., 1939, 113, 1563—1564).—Coloured lantern slides were made from Ishihara or Stilling charts by the Kodachrome process. It is said that, when tested on colour-defectives, the results are the same as those found with the original charts. K. T.

Comparative effect of cobra venom and opiates on vision. D. I. MACHT and M. B. MACHT (J. Exp. Psychol., 1939, 25, 481—493).—Morphine, codeine, heroin, dilaudid, and pantopon narrow the field of vision in the progressive order white, blue, red, and green. Cobra venom tends to increase visual acuity and markedly widens the visual field for the 4 colours in the order white, blue, red, and green. This effect may be in part due to the effect on the circulation in the eye and in part to the direct effect of the drug on the brain. K. J. W. C.

Is one eye or a field of vision (corresponding with one side of the brain) used better than the other? G. JAHN (Pflüger's Archiv, 1938, 240, 352—376).—An investigation was made of (i) whether

when both eyes possess equal acuity of vision, one of them has "eyedness," (ii) whether one field of vision is more sensitive to stimuli than the other. The influence of handedness was eliminated. The results show that when "eyedness" is present it is not a property of the central optical apparatus but is due to other factors. To determine whether there exists a "brainedness" (better use of one field of vision due to central factors) the Latoscope of Stern, and a new apparatus (the Pleuroscope) with which the sensitivity of equiv. parts of the retina of the right and left eyes could be determined, were used. In a minority of individuals a "brainedness" was observed which usually, but not always, corresponded with the handedness. J. M. R.

Hysterical blindness in children. E. WOLF and G. S. LACHMAN (Amer. J. Dis. Child., 1938, 56, 743—749).—Report of 2 cases. C. J. C. B.

Vitamins in ophthalmology and otolaryngology. Review of recent experimental and clinical observations. W. H. EVANS (Eye, Ear, Nose, and Throat Month., 1939, 18, 299—304). H. L.

Progress in otolaryngology. Anatomy and physiology of ear. J. R. RICHARDSON, E. M. HOLMES, and W. MUELLER (Arch. Otolaryng., 1939, 29, 560—577).—Summaries of the literature published between October, 1937, and September, 1938. H. L.

Supernumerary external ears. M. J. COSTELLO and J. H. SHEPARD (Arch. Otolaryng., 1939, 29, 695—698).—Short description of 4 cases, 2 of which were familial. H. L.

Stapes, fissula ante-fenestram, and associated structures in man. II. From the foetus at term to the adult of seventy. B. J. ANSON, J. E. KARABIN, and J. MARTIN (Arch. Otolaryng., 1939, 29, 939—973).—Fully illustrated anatomical description of these organs at various developmental stages. H. L.

Penetration of the inner ear by mercurochrome. E. L. ROSS and J. W. HAMILTON (Arch. Otolaryng., 1939, 29, 428—436).—8% solution of mercurochrome was injected into the middle ear of dogs, pptd. after 20 min—2 hr. by 2% HCl, and its penetration examined in air-dried frozen sections after decalcification of the bones. The dye had passed through all tissues between middle and inner ear; its distribution makes it improbable that permeation was mainly through the fenestra rotunda. H. L.

Effect of stimulation and paralysis of inner ear on rate of lymph-hearts. D. OGATA, F. YOSHIDA, and T. AKAHANE (Compt. rend. Soc. Biol., 1939, 132, 166—168).—In *Rana micromaculata*, the rate of the lymph-hearts is increased following stimulation of the inner ear by CHCl_3 ; the increase is higher in the homolateral organ. A decrease in the rate is produced by cocainisation of the inner ear. H. L.

Acoustics of hearing. II. Mechanical properties of cochlea. G. VON BÉKÉSY (Acta otolaryng., 1939, 27, 388—396).—By recording movements of the head it is shown that the static organs are influenced by sounds of large amplitude. By

frequency analysis of sounds which are perceived as coming from different distances it is shown that the judgment of distance in hearing is associated with the perception of sound-frequency. H. L.

Objective measurement of hearing. M. UNGER (Arch. Otolaryng., 1939, 29, 621—623).—Hearing of a sudden noise causes reflex dilatation of the pupils quickly followed by contraction. A hearing test based on examination of this reflex is described. H. L.

Research in audition: the next steps. W. HUGHSON and E. THOMPSON (Arch. Otolaryng., 1939, 29, 903—918).—In investigations on the significance of abnormal arterial and cerebrospinal pressure for impaired hearing, more attention should be given to endocrine and nutritional disorders. H. L.

Hyperacusis. H. B. PERLMAN (Ann. Otol., Rhin., and Laryng., 1939, 47, 947—953).—Two types are distinguished: lowering of hearing-threshold (oxyecia) and lowering of discomfort-threshold (hyperaesthesia dolorosa). In a case of the last type (due to unilateral facial paresis) the effect of stapedius paresis was studied by investigating hearing sensation for threshold- and over-threshold-sounds, aural fatigue, the effect of masking, and the adaptation phenomenon. Discomfort appeared at intensity levels which cause in normal subjects stapedius contraction. Adaptation appeared after a period equal to that in which stapedius contraction normally disappears. Fatigue was more marked in the affected ear and the recovery period longer. H. L.

Sound-masking for hearing tests. M. AUBRY and J. C. GIRAUD (Ann. d'oto-laryng., 1939, 4, 333—348).—Description of a new method of sound-masking, preventing both air- and bone-conduction, by means of a current of air or gas of a certain pressure thrown on the tympanic membrane. H. L.

Effects of aeroplane noise on auditory acuity of aviators. E. D. D. DICKSON, A. W. G. EWING, and T. S. LITTLER (J. Laryng. Otol., 1939, 54, 531—548).—Transient high-tone deafness has been found by audiometric tests in persons exposed to aeroplane engine noise after a few hundred flying hr.; after a longer flying time the loss becomes permanent and progressive, producing a serious disability when speech frequencies become involved. The loss by bone conduction corresponds with that by air conduction. Wave analysis of aircraft noise has shown that all components of large amplitudes are low in frequency. Various methods by which a hearing loss can probably be prevented are discussed. H. L.

Presbycusis. Auditory loss with increasing age and its effect on perception of music and speech. N. H. KELLEY (Arch. Otolaryng., 1939, 29, 506—513).—For low frequencies (up to 512 cycles) slight loss was found only in subjects over 70 years; the loss for 1024 c. in the same age group was 14 decibels. For higher frequencies hearing loss was more variable but on the average it was more extensive, progressive with increasing age, and the greater the higher the frequency. On elimination of

frequencies above 4000 c. no difference in tonal quality of violin sounds was perceived by presbycusis subjects. Recognition of vowels was found inferior only at intensities lower than used in ordinary conversation but only 75% of consonants were recognised in speech at ordinary intensity. H. L.

Defective hearing and nutrition in children. P. M. T. KERRIDGE, G. BRIGGS, D. P. CHOYCE, and J. HILL (*Lancet*, 1939, 237, 781—785).—Audiometer tests showed that middle-ear disease is about 4 times as common in children living under poor social conditions as in those living under good conditions. The most important factor is nutrition, climate and housing being relatively unimportant. C. A. K.

Problem of hard of hearing school child. J. C. GEIGER, F. H. RODIN, and B. A. CHASE (*Arch. Pediat.*, 1939, 56, 605—610).—Review of deafness among 86,000 school children in San Francisco between 1928 and 1938. C. J. C. B.

Family with congenital deaf-mutism in first part of 18th century and their descendants. K. ULRICH (*Acta oto-laryng.*, 1939, 27, 505—508).—In two succeeding generations of a family, descending from normally hearing parents, 6 individuals had been congenitally deaf-mute. 390 of their descendants could be traced; none of them was deaf-mute. It is concluded that either the relevant character has disappeared or that none of the descendants has had two heterozygote parents. H. L.

Range of hearing of canaries. A. R. BRAND and P. P. KELLOG (*Science*, 1939, 90, 354).—The range of hearing investigated in 5 canaries by means of a conditioned reflex was found to be slightly over 3 octaves (1100—10,000 c.p.s.). The canary hears all sounds produced in its song but does not hear low and moderately high sounds. H. L.

Attempt at precision measurements of ear. I. H. JONES (*Laryngoscope*, St. Louis, 1939, 49, 505—557).—Review of Elsberg's quant. olfactometry, of vestibular tests, of audiometry, and of sound-masking methods. H. L.

Petrous apex of temporal bone and its relations. W. J. MELLINGER (*Arch. Otolaryng.*, 1939, 29, 484—505).—Detailed description of the surgical anatomy and of anatomical variations the clinical significance of which is fully discussed. H. L.

Pathogenesis of Menière's disease and of kindred conditions in ear and rest of body. S. H. MYGIND and D. DEDERDING (*Ann. Otol., Rhin. and Laryng.*, 1938, 47, 938—946).—Experiments on normal and injured living cells and examination of agonal changes in Corti's organ serve to prove that Menière's disease is due to local capillary dysfunction and increased permeability resulting in oedema-formation. By producing increased endolabyrinthine pressure and thereby outward dislocation of the stapes, cellular oedema causes impairment in bone-conduction. The increase in both intracellular and endolabyrinthine pressure is also responsible for the vestibular symptoms. Considerable fluctuations are common in vasomotor disturbances and explain their paroxysmal character. H. L.

D (A., III.)

Process of healing in injuries to capsule of labyrinth. H. B. PERLMAN (*Arch. Otolaryng.*, 1939, 29, 287—305).—Detailed histopathological description of the various stages in healing of sterile perforating and non-perforating lesions in the rabbit and dog. H. L.

Labyrinthine fistulas. Vital response to various methods of producing defects in bone. N. CANFIELD (*Arch. Otolaryng.*, 1939, 30, 50—62).—The undesired closure of artificial labyrinthine fistulas is due to periosteal regeneration. Defects were made in the skull of cats by sharp and dull instruments and covered with periosteum. 14 days later periosteal proliferation was seen in the defects produced by a sharp chisel or by a rotary saw; it was absent or significantly less in amount in those made by a dull drill or by a polishing burr. H. L.

Holmgren's operation for otosclerosis in monkeys. F. R. NAGER (*Acta oto-laryng.*, 1939, 27, 350—358).—Labyrinthine fistulas made in monkeys by Holmgren were found to be closed after various periods through periosteal proliferation. Bone formation seemed considerably reduced when Ra had been placed into the wound; less effect was seen from implantation of squamous epithelium and none from various other substances. In cases not complicated by operative damage to the middle ear no other changes were found in the labyrinth. H. L.

Physiology of labyrinth and new model of semicircular canals. W. STEINHAUSEN (*Acta oto-laryng.*, 1939, 27, 107—122).—A detailed criticism of Wittmaack's investigations on the physical properties of the semicircular canals and the endolymph. A new model of the semicircular canals is described which serves to verify Mach and Breuer's theory of endolymph currents on both central and eccentric rotation. H. L.

Structure of otoliths in pike. F. H. QUIX and A. J. VAN EGMOND (*Ann. d'oto-laryng.*, 1939, 1, 38—51).—A description is given of ligaments by which the otoliths in the pike are held in position, with a detailed account of the position of the otoliths within the membranous labyrinth. H. L.

Taste-testing the anthropoid apes. R. A. FISHER, E. B. FORD, and J. HUXLEY (*Nature*, 1939, 144, 750).—Taste-testing with solutions of phenylthiocarbamide (6 $\frac{1}{2}$, 50, 400 p.p.m. respectively; sweetened by 2% sucrose) showed that the proportion of tasters to non-tasters is in chimpanzees, and possibly also in orang-utans, about the same as in man. It is concluded that the heterozygotes for this character have had a selective advantage over the homozygotes in the lineage of chimpanzees and man during a period of several million generations. H. L.

(xi) DUCTLESS GLANDS, EXCLUDING GONADS.

Effects on blood from injections of endocrine principles in female. C. A. HILL (*Amer. J. Obstet. Gynec.*, 1939, 37, 47—53).—Complete blood counts were taken, of 30 female patients, aged 17—64 years, known to have a definite hypochromic anæmia and also symptoms of a marked endocrine unbalance,

previous to and following a course of treatment with various endocrine principles given either by injections or orally. After injection of pituitary-like substances, 76% of the patients showed a 10—20% increase, while 23.5% showed a decrease in the erythrocyte count and % of hæmoglobin. After œstrogen injection 60% of patients showed an increase, whilst 40% showed a decrease. The blood picture has been more satisfactorily stabilised when orally administered glands are given after the injection of endocrine principles.

M. H.

Cytological changes induced in hypophysis by prolonged administration of pituitary extract. A. E. SEVERINGHAUS and K. W. THOMPSON (Amer. J. Path., 1939, 15, 391—412).—The "Crooke changes" described only in the human pituitary gland were experimentally produced in dogs. Although individual cells with the Crooke change were found in the hypophyses of the dogs that had prolonged injections of anterior pituitary lobe extract, they were much more common in those dogs injected with antihormone serum. Basophilic changes, characteristic of castration and thyroidectomy, on the contrary, were the outstanding characteristics of the former group, presumably because of the longer period of injections. Sheep injected with pituitary extract showed almost universal degranulation of the basophilic cells. The acidophil cells seemed increased in size and were compactly granulated. (33 photomicrographs.)

C. J. C. B.

Differential diagnosis of forms of basophilism (Cushing's syndrome), particularly by estimation of urinary androgens. A. C. CROOKE and R. K. CALLOW (Quart. J. Med., 1939, 8, 233—249).—Estimation of urinary androgens by colorimetric assay of 17-ketosteroids, and by capon comb-growth, showed in 4 cases of basophilism that 2 with proved malignant adrenal tumours had increased excretion (2—3 times and 20—35 times normal), the former becoming subnormal after removal of tumour. *trans*-Dehydroandrosterone was isolated from both, and in the latter accounted for 70% of the comb-growth activity of the urine. 2 cases without adrenal tumour showed 1—2 times normal and subnormal excretion. In no case was œstrogen excretion grossly excessive.

R. K.

Anorexia nervosa and pituitary cachexia [Simmonds' disease]. G. F. VAN BALEN (Acta med. scand., 1939, 101, 433—450).—Review and discussion of 82 cases of pituitary cachexia found in the literature. (B)

C. A. A.

Effect of pituitary thyrotropic extract in subjects with low basal metabolic rates. E. P. SHARPEY-SCHAFFER and I. SCHRIRE (Quart. J. Med., 1939, 8, 195—208).—Intramuscular injection of thyrotropic principle (ambinon 1 c.c. = 100—300 Heyl-Laqueur units daily for 3—6 days) into 22 normals, 5 with low basal metabolic rate (b.m.r.) but no myxoedema, and 5 endocrine disorders with normal thyroid, gave an increase of b.m.r., increased creatinuria, and clinical changes. Malaise, enlarged tender thyroid, and tachycardia appeared after 3—4 days, and subsided 48 hr. after injections ceased. Only 3 developed tremor, and none exophthalmos. 3

myxoedemas and 1 cretin failed to respond. 3 with low b.m.r. but no myxoedema also failed, and a biopsy in one showed a resting gland; all 3 had gonadal deficiency.

R. K.

Effect of prolactin on oviduct of batrachians. I. L. C. DE ALLENDE (Rev. Soc. argent. Biol., 1939, 15, 190—193).—Out of 20 female toads (*Bufo arenarum*) with medium to max. development of the oviducts, 8 showed secretory activity after injecting 1 to 40 mg. The effect was not related to the dose given. 6 animals with atrophic oviducts did not respond to prolactin.

J. T. L.

Prolactin in nursing women. M. KENNY and E. KING (Lancet, 1939, 237, 828—831).—Prolactin (from ox or sheep pituitary) increased the flow of milk in about 75% of 43 nursing women with deficient secretion. The quality of milk was unchanged and no toxic effects or side-reactions were seen. Notes on the prep. of prolactin by N. EVERS and W. J. HURRAN are given.

C. A. K.

Diabetes insipidus in children. J. WARKANY and A. G. MITCHELL (Amer. J. Dis. Child., 1939, 57, 603—666).—A crit. review of ætiology, diagnosis, and treatment, with report of 4 cases.

C. J. C. B.

Hypophysis implantation in case of diabetes insipidus. E. KYLIN (Acta med. scand., 1939, 191, 566—567).—Gluteal injection of macerated calf hypophysis caused a reduction in the urinary vol. from 5000 to 800 c.c. per day.

C. A. A.

Sodium chloride and diabetes insipidus. H. G. SWANN (Amer. J. Physiol., 1939, 126, 341—346).—Diabetes insipidus was induced in rats by posterior hypophysectomy. Fasting for 2 days diminished the fluid intake from 26 c.c. per day (about 3 times normal) to 13 c.c. per rat per day. This effect of fasting was prevented if during the fast the animals were given 0.24 g. of NaCl per os per day in a small vol. of water. If in the established phase of diabetes insipidus the NaCl content of the diet is changed, there follows an acute drop in water intake almost to the pre-operation level. Neither fasting nor low NaCl intake affects the so-called transient phase of experimental diabetes insipidus which appears even in the 2 days following operation when the animal does not eat. It is believed that the changes in water metabolism in diabetes insipidus are secondary to changes in NaCl metabolism.

M. W. G.

Carcinoma of thyroid gland in children. A. G. LANGMANN and H. BRUCH (Amer. J. Dis. Child., 1938, 56, 616—638).—Report of a case associated with multiple anomalies of development, with studies of basal metabolism, serum-cholesterol, and creatine excretion after thyroidectomy. (B.) (3 photomicrographs.)

C. J. C. B.

Hypothyroidism and cretinism in childhood. VI. **Influence of thyroid therapy on mental growth.** A. W. BROWN, I. P. BRONSTEIN, and R. KRAINES (Amer. J. Dis. Child., 1939, 57, 517—523).—In general, there was a slight increase in the intelligence quotient during the period of treatment since referral to the clinic. The increase was greatest for those who began treatment early. Even with

treatment, most of the children remained severely retarded, having intelligence quotients below 70. The chances are that at maturity their mental level will not be much above 10 or 11 years. There is no evidence that cretins have any special aptitudes or abilities. The retardation seemed general. When on successive examinations mental ages were plotted in Heinis mental growth units, the curves seemed to have the same general shape as the curve for the average child except that they were at a lower level. Examination of a no. of the siblings indicated that the cretins did not come from families of low intellectual status. In a study of 13 cretins there appeared to be some relation between development of carpal bones and mental age. C. J. C. B.

Intrathoracic goitre. G. CRILE (Cleveland Clin. Quart., 1939, 6, 313—322).—The incidence, pathology, aetiology, symptoms, diagnosis, and treatment of intrathoracic goitre are reviewed. A description is given of the operative technique employed by the author in 97 cases. Large intrathoracic goitres are rare. F. R. SE.

Nodular myxœdema complicating thyrotoxicosis. F. HANDLEY and J. G. DOWNING (Arch. Dermatol. Syphilol., 1939, 40, 374—379).—A case of nodular myxœdema of the lower parts of the legs complicating thyrotoxicosis in a young man is reported. There was no pre-existing œdema of the legs; the eruption appeared before operation on the thyroid and was not relieved by treatment. (2 photomicrographs.) C. J. C. B.

Effect of thyroxine and dinitrophenol on metabolism during urethane anaesthesia. N. ALWALL and S. SYLVAN (Acta med. scand., 1939, 101, 290—297).—Deep urethane narcosis inhibits the increased O_2 consumption in rabbits caused by thyroxine, but not that caused by dinitrophenol. The potentiation of thyroxine action by dinitrophenol is prevented by deep urethane anaesthesia. C. A. A.

Serum-phosphatase in hyperthyroidism. W. DUDLER (Verh. Schweiz. Physiol., 1939, 14th Meeting, 14—17).—Serum-inorg. phosphate and -phosphatase (determined by Bodansky's method) are increased in experimental and clinical hyperthyroidism. A. S.

Creatine-creatinine metabolism in hyperthyroidism. A. WYSS (Verh. Schweiz. Physiol., 1939, 14th Meeting, 25—27).—The diminution of the creatine-creatinine content of liver, skeletal and heart muscle in experimental hyperthyroidism in rats is prevented if the animals are kept on a protein- and fat-rich diet. A. S.

Treatment of chronic hypoparathyroidism. I. A. ANDERSON and A. LYALL (Quart. J. Med., 1939, 8, 209—232).—Ca and P balance experiments in 3 cases of post-operative tetany showed with Ca intake 2 g. daily, and low P but sufficient to maintain balance (0.5—0.65 g. daily), a rise of serum-Ca to normal levels; a fall occurred if P intake was 0.89 g. daily. Serum-P changes preceded those of Ca, and were not due to retention and extra loss, but to exchanges in the tissues. 30,000 i.u. of vitamin-D did not raise serum-Ca, but increased Ca retention,

whilst 45,000 i.u. raised serum-Ca, even on high P intake. 270 c.c. of 0.1N-HCl daily increased the Ca rise, and were necessary in one case with nephritis to counteract the alkalosing effect of Ca lactate.

R. K.

Tetany syndrome in newborn infants. Remote deposit of calcium salts following injection of calcium gluconate. W. R. SHANNON (Amer. J. Dis. Child., 1938, 56, 1046—1054).—2 cases are presented in which, complicating the treatment for severe tetany of the newborn, Ca salts were pptd. not only at the site of local injection of Ca gluconate but at remote points in the body. Reabsorption eventually occurred without known permanent damage. C. J. C. B.

Biochemistry of hypoglycæmic shock. II. Tissue-chlorides. F. ROMEO (Arch. Farm. sperim., 1939, 68, 99—104; cf. A., 1939, III, 1050).—High insulin dosage in rabbits diminishes the Cl' content of muscle, stomach, and kidney tissues; that of liver is unchanged whilst that of brain tissue is increased. F. O. H.

Experiences with depot insulin. F. WALINSKI and L. HAHN (Med. Klin., 1939, 35, 1114—1115).—Surfen insulin was successfully used in 34 diabetics. The insulin requirement decreased by 25—33%. One patient showed local hypersensitivity reactions. A. S.

Prolonged use of protamine-zinc-insulin. H. O. MOSENTHAL and M. F. MARK (J. Amer. Med. Assoc., 1939, 113, 17—22).—Details of the clinical use of protamine-Zn-insulin are described. C. A. K.

Water balance studies in adrenalectomised dogs. I. E. UYLDERT (Acta brev. neerl. Physiol., 1938, 8, 112—114).—Water excretion in normal or unilaterally adrenalectomised dogs amounts to 45—46% of the water intake; the diuresis amounts to more than 100% of the intake after double adrenalectomy. The diuresis is diminished following the administration of cortical extracts and of NaCl. A. S.

Action of pyruvic acid on adrenalectomised rats. L. LASZT (Verh. Schweiz. Physiol., 1939, 14th Meeting, 20—22).—Glucose absorption from rat's intestine is diminished after adrenalectomy. Subcutaneous injection of pyruvic acid (12—24 mg.) restores glucose absorption to normal but does not affect the diminished glycine absorption. Adrenalectomised rats do not show fatty degeneration of the liver after poisoning with P; fatty degeneration was observed if the rats were also treated with pyruvic acid. A. S.

Relation of adrenal cortex to male reproductive system. I. GERSH and A. GROLLMAN (Amer. J. Physiol., 1939, 126, 368—374).—The development of the secondary reproduction organs (prostate, Cowper's gland) of male rats and mice was compared in normal, castrated, and castrated adrenalectomised animals maintained on adequate doses of cortical hormone (per os). The results indicate that the adrenal gland does not exert an androgenic function in the normal animal. Neither the "juvenile" cell of the rat nor the X-zone of the mouse normally

exerts an androgenic function. The adrenal cortical hormone exerted no androgenic effects on the development of the ventral and dorsal prostate glands, of Cowper's glands, or of the seminal vesicles of normal or castrated rats and mice. Extracts of human or pig foetal adrenal glands and of X-zone-bearing glands from mice were also devoid of androgenic activity.

M. W. G.

Scleroderma associated with adrenal neoplasm. G. B. BARLOW (Arch. Dermatol. Syphilol., 1939, 39, 1021—1024).—Report of a case.

C. J. C. B.

Adrenal neuroblastoma. J. L. REDMAN, H. A. AGERTY, O. F. BARTHMAIER, and H. R. FISHER (Amer. J. Dis. Child., 1938, 56, 1097—1112).—113 cases of adrenal neuroblastoma in infants and children have been reported since the review of Scott, Oliver, and Oliver (1933). One further case is reported and the disease reviewed. (B.)

C. J. C. B.

Adrenal neuroblastoma. R. M. GREENTHAL and E. EPSTEIN (Arch. Pediat., 1939, 56, 561—573).—A case of adrenal neuroblastoma is reported in a 5-year old boy, which originated from a neurocytoma of the left adrenal. An area of this tumour grew rapidly and differentiated to form neuroblast cells and metastasised widely. The metastatic cells simulated erythropoiesis and the biopsy specimens gave the appearance of erythroblastomatosis. (3 photomicrographs.)

C. J. C. B.

Relation of various groups of adrenaline molecule to its intestine-inhibiting function in unanaesthetised dogs. W. B. YOUMANS, K. W. AUMANN, and H. F. HANEY (Amer. J. Physiol., 1939, 126, 237—246).—The effects, on tonus and motility of innervated and denervated Thiry or Thiry-Vella fistulae in unanaesthetised dogs, of controlled intravenous injections of adrenaline, arterenol, cobefrin, epinine, kephrine, neosynephrin, and synephrin were recorded. All these compounds produced decreased tonus and inhibition of rhythmic contractions. Within one or two weeks after postganglionic denervation the intestine becomes 2 to 8 times as sensitive to each of these compounds as before denervation. Removal of any of the groups characterising adrenaline in the nucleus $C_6H_3 \cdot C \cdot C \cdot N$ results in a compound of less intestine-inhibiting potency. The most important single group appears to be the OH *meta* to the side-chain; next in order are the *p*-OH, the secondary alcoholic OH, and least important the CH_3 on the N.

M. W. G.

Adrenaline content of adrenal glands in diphtheria intoxication. C. A. ASHFORD (Brit. J. exp. Path., 1939, 20, 385—391).—There is no significant difference in adrenaline content of the adrenals between normal and toxæmic guinea-pigs. Histological findings are reported and the possible significance of cortical damage is discussed. F. R. SE.

Unusual reactions to slow epinephrine. J. COHN (J. Allergy, 1939, 10, 459—461).—4 cases are reported in which slow adrenaline was used with the following unusual symptoms: nausea, vomiting, chills, vesicular urticaria, cyanosis, increased dyspnoea, and swelling and œdema of the forearm.

C. J. C. B.

Renal and vascular responses to adrenaline injections in glomerular and aglomerular fish. L. A. TOTH (Amer. J. Physiol., 1939, 126, 347—353).—A detailed report of work already noted (A., 1938, III, 586).

M. W. G.

(xii) REPRODUCTION.

Chemical nature of substance secreted by eggs of *Arbacia pustulosa* to allure spermatozoa.—See A., 1939, II, 482.

Histological process of ovarian atresia in hypophysectomised frog. L. GALLIEN (Compt. rend. Soc. Biol., 1939, 131, 689—692).—The atresia is produced by a thickening of the follicular layer and digestion of the cytoplasm of the egg, together with leucocytic invasion. This process occurs only in those eggs that have not undergone vitellogenesis. In those eggs that have reached maturity the process of leucocytic invasion is more pronounced; there is hypertrophy of the richly vascular thecal layer leading to resorption of the ovocyte, giving place to large black corpora atretica. None of these changes occurs until the ovocyte reaches a size of 350—400 μ .

P. C. W.

Effect of polypeptides on genital tract of white rat. H. BULLIARD and I. GRUNDLAND (Compt. rend. Soc. Biol., 1939, 131, 887—889).—Injection of polypeptides in the ovariectomised rat produces proœstrus, stratification of the vaginal epithelium, and a cornification less pronounced than in œstrus. In the immature male the injections stimulate priapism, and increase the wt. of the glands of Tyson (60%) and the wt. of testes, prostate, and seminal vesicles (10—15%).

P. C. W.

Action of œstrogen on skeletal tissues of immature guinea-pigs. M. SILBERBERG and R. SILBERBERG (Arch. Path., 1939, 28, 340—360).—(œstrogen administered to immature guinea-pigs for 3 to 60 days causes regression, increased hyalinisation, and ossification of the ground substance in the epiphyseal discs, ribs, and vertebrae. The cartilage cells temporarily cease to grow and differentiate; later they show degeneration followed by proliferation and hypertrophy. Growth is accompanied by greater breakdown of the growing cartilage and replacement by bone or by an accentuated direct metaplasia of columnar and hypertrophic cartilage cells into osteocytes. These processes may be considered as premature ageing of the cartilage. A transitory deposition of osteoid tissue around the pre-existing trabeculae is followed by resorptive processes of the bony substance. It is not certain that these effects are sp. to certain hormones. (9 photomicrographs.)

C. J. C. B.

œstrogens with oxygen in ring B. 7-Keto- and 7-hydroxy-œstrone.—See A., 1939, II, 510.

Action of follicle hormone in incontinence of urine. E. STEINKAMM (Dtsch. med. Wschr., 1939, 65, 1237—1240).—Incontinence of urine following Wertheim's operation was benefited by follicle hormone treatment.

A. S.

Effect of sex hormones on regulation of blood-sugar. I. Action of α -œstradiol benzoate. E.

ZUNZ and J. LA BARRE (Arch. int. Physiol., 1939, 48, 287—328).—Intravenous or intramuscular injection of α -oestradiol benzoate (300—400 units per kg.) raised the blood-sugar of unanæsthetised or chloralose-anæsthetised dogs and lowered the blood-sugar of chloralosed dogs with ligated suprarenal vessels. Intramuscular injections were more effective. Thoracic section of the vagus or splanchnic nerves did not alter any of the findings. Injected similarly, only 50% of thyroidectomised dogs showed the same alterations, either with or without ligated suprarenal vessels. The injection of the above dose of α -oestradiol benzoate did not lower the hyperglycæmia of depancreatized dogs. W. BU.

Isomeric δ -di-*p*-hydroxyphenyl- Δ^{β} -*n*-hexenes.—See A., 1939, II, 503.

Keratoderma climactericum (Haxthausen's disease) [treated with oestrone]. L. C. GOLDBERG (Arch. Dermatol. Syphilol., 1939, 40, 67—69).—Report of a case. Biweekly injections of oestrone in oil (2000 units) and superficial roentgen therapy brought about a complete cure. C. J. C. B.

Effect of oestrone on oviduct of the toad *Bufo arenarum*. I. L. C. DE ALLENDE (Rev. Soc. argent. Biol., 1939, 15, 185).—Oestrone was injected in doses from 480 to 10,000 i.u. daily during 3—10 days. No histological modification was observed. In $\frac{1}{3}$ of the cases injected with the largest dose during 10 days, a secretory activity of the oviduct glands was observed; this effect is not considered physiological. The lack of response to oestrone of the oviduct in this species contrasts with what is observed in mammals. J. T. L.

Hormonal reactions of pregnancy. L. DOB-SZAY (Amer. J. Dis. Child., 1938, 56, 1280—1293).—Injections of oestrogen (100,000—150,000 units) into infants, followed by injection into the vagina of Doderlein's bacilli, caused the bacilli to proliferate and establish themselves. Small doses of oestrogen had no such effect. The oestrogen causes first addition of glycogen and then desquamation of the vaginal mucous membrane. A glycolytic ferment freed by the disintegration of the desquamated cells increases the acidity of the vagina and thus affords a suitable bed for the growth of the Doderlein's bacilli, which themselves then form further acid. (1 photomicrograph.) C. J. C. B.

Placental hormones in prolonged pregnancy. K. D. ROSENKRANZ (Arch. Gynäk., 1939, 168, 51—57).—The placenta content of follicle hormone increases at the end of normal pregnancy. In cases of prolonged pregnancy, the progesterone content of the placenta does not decrease as under normal conditions. A. S.

Gonorrhœal vaginitis of children [relation to blood-oestrogen and vaginal p_{H}]. R. A. BENSON, A. STEER, and F. D. SPEER (Amer. J. Dis. Child., 1938, 57, 291—305).—There is a variation in the type of normal vaginal secretion in infants and children which depends on the oestrogenic content of the blood and there is an associated variation in the p_{H} of the vaginal secretion. The variations of p_{H} of the vaginal secretion at different ages are discussed. It is sug-

gested that these may be a factor determining susceptibility to infection. (7 photomicrographs.) C. J. C. B.

Gonorrhœal vaginitis in girls treated with oestrone (theelin) fever and sulphanilamide. C. M. BURPEE, M. ROBINOW, and J. T. LESLIE (Amer. J. Dis. Child., 1938, 57, 1—14).—Apparent cures, following the intramuscular injection of theelin in oil as the only form of treatment, were obtained in 41 of 47 cases (87%). In 5 of these (12%) there were recurrences. 5 patients treated with theelin and 1% AgNO₃ jelly were cured and did not have recurrences. Apparent cures following fever as the only method of treatment were obtained in 8 of 19 cases (42%); there was 1 recurrence (12.5%). In 6 of 7 patients treated with fever during theelin therapy apparent cures could be attributed to the fever. The fever was produced by the intravenous injection of typhoid vaccine and in 5 cases by the Kettering hypertherm. Apparent cures followed the oral administration of sulphanilamide as the only method of treatment in 11 of 22 cases (50%). One patient had a recurrence. 2 patients were cured by a combined treatment with fever and with sulphanilamide; one of these had a recurrence. All cures due to sulphanilamide were obtained in less than 2 weeks. Increase of the dose, prolongation of the treatment, and combination with fever therapy did not improve the results. C. J. C. B.

Stilbœstrol and abortion in cow. S. J. FOLLEY and H. M. S. WATSON (Lancet, 1939, 237, 788—789).—Stilbœstrol dipropionate given by inunction to the udders produced abortion in 2 cows in late pregnancy but was ineffective in 2 cows in early pregnancy. C. A. K.

Effect of stilbœstrol on menstruation. R. WENNER and K. JOËL (Lancet, 1939, 237, 688—691).—Stilbœstrol was given to 9 spayed women, the state of the endometrium being observed by curettage. 25 mg. by mouth or 15 mg. intramuscularly produced proliferation of a resting or atrophic endometrium; 50—60 mg. by mouth produced glandular cystic hyperplasia. The stage of transformation and menstruation was produced by 220—300 mg. of anhydro-oxyprogesterone given by mouth. Stilbœstrol (5—15 mg. by mouth) inhibited lactation in 20 women. C. A. K.

Effects induced in pregnant rats by injection of chemically pure carcinogenic agents. J. M. WOLFE and W. R. BRYAN (Amer. J. Cancer, 1939, 36, 359—368).—Daily subcutaneous injections of 5 mg. of 1:2:5:6-dibenzanthracene, 3:4-benzopyrene, or 1:2-benzanthracene were begun on the 1st day of pregnancy. Profuse vaginal hæmorrhage was observed, beginning at the 10th—12th day and persisting until the animal was sacrificed. The pregnant uterus showed marked hæmorrhages in the lateral margin of the placenta which often caused distension of the foetal sites and of the adjoining uterine lumen. Histologically the foetal sites also showed tissue destruction. The uterine epithelium extending over the decidua reflexa was destroyed in most cases, resulting in a passage of blood into the uterine lumen. There was cessation of foetal growth

and progressive destruction and resorption of all foetal and placental tissue. This pathological process was usually completed by the 18th day of pregnancy.

F. L. W.

Sterols. LXX. Steroid content of mares' pregnancy urine. R. E. MARKER and E. ROHRMANN (J. Amer. Chem. Soc., 1939, 61, 2537—2540).—Mares' pregnancy urine differs from other urines in the ratio of diols present [pregnane-3(α):20(α)-3, *allopregnane*-3(α):20(α)-2, *allopregnane*-3(β):20(α)-diol 25 mg. per gallon] (cf. A., 1939, III, 266) and in containing more tar and a larger no. of compounds. The carbinols from 10,000 gallons of the urine were investigated. The sterols pptd. by digitonin yield a 1:1 mol. compound, m.p. 191—192.5°, of cholesterol and urane-3(β):11-diol. The carbinol fraction not pptd. by digitonin yields, when oxidised, pregnane- and *allopregnane*-dione and 3-*deoxy*-11-*keto*equilenin (?), C₁₈H₁₆O₂, m.p. 212—214° [*semi*-*carbazone*, m.p. 255—260° (decomp.)]. Bromination and mild oxidation (CrO₃) of fractions pptd. by digitonin yields uranetriolone and a *trione*, C₂₁H₃₀O₃, m.p. 127—129° (*disemicarbazone*, +0.5H₂O, m.p. above 300°), indicating the presence of urenetriol and a new *allopregnanetriol* in the urine. The hydrocarbon, m.p. 64°, is also isolated.

R. S. C.

Homogeneity of gonadotropic hormone preparations isolated from pregnancy urine. S. GURIN, C. BACHMAN, and D. W. WILSON (J. Amer. Chem. Soc., 1939, 61, 2251).—Homogeneity of gonadotropic fractions previously described (A., 1939, III, 687) (isoelectric point p_H 3.2—3.3) is demonstrated by ultracentrifugal and electrophoretic results.

R. S. C.

Effects of extracts of pregnant mare serum and human pregnancy urine on reproductive system of hypophysectomised male rats. S. H. LIU and R. L. NOBLE (J. Endocrinol., 1939, 1, 7—14).—Immediate post-operative treatment with an extract of pregnant mare serum stimulated the interstitial cells of the testes, with consequent enlargement of the accessory reproductive glands, and maintained spermatogenesis. Fertile mating occurred. Pregnancy urine extract was ineffective in similar dosage. When treatment was delayed until 14—28 days after operation the dosage had to be raised 5—10 times to be effective and in this case the pregnancy urine extract was more effective in restoring spermatogenesis, although the mare serum extract was still more effective as an interstitial cell stimulator.

P. C. W.

Placenta accreta. H. H. NORAN (Arch. Path., 1939, 28, 532—537).—2 cases of placenta accreta are reported in which intrauterine irradiation had preceded conception. There was no history of abnormality in previous pregnancies in either case. Both placentas showed hyaline degeneration of the decidua and poor development of the spongy layer. (3 photomicrographs.)

C. J. C. B.

Action of mixtures of quinine and posterior pituitary extract on virgin guinea-pig uterus. H. A. SHAPIRO (S. Afr. J. Med. Sci., 1939, 4, Suppl., 9—12).—The addition of quinine mono- or di-hydrochloride to posterior pituitary extracts lessens their

oxytocic activity. The action is probably due to a paralysis of the uterine muscle.

P. C. W.

Paradoxical effects of oestrone in male animals. S. E. DE JONGH, A. QUERIDO, and L. A. M. STOLTE (Arch. int. Pharmacodyn., 1939, 62, 390—398).—In castrated mice progesterone counteracts the effects of oestrone on the vas deferens and seminal vesicle, but has no appreciable action on the antimasculine effects.

D. T. B.

Effect of luteal hormone. G. BAGALÀ (Boll. Soc. ital. Biol. sperim., 1939, 14, 298—299).—Injection of progesterone into guinea-pigs during the second half of pregnancy does not inhibit the post-partum ovulation.

F. O. H.

Effect of sex hormones on accessory sex glands C and c in the hedgehog. J. MOMBAERTS (Compt. rend. Soc. Biol., 1939, 131, 791—794).—The c glands (external prostate) of the hedgehog consist of two independent elements: the peripheral acinar tissue and the internal excretory tubules. In the male in autumn the involution of the acini is more pronounced than that of the tubules. The same is found in castration. Oestradiol stimulates the tubules; this action is antagonised by progesterone. Testosterone stimulates both parts of the glands and does not antagonise oestradiol. In the female the involution is not pronounced in the autumn but ovariectomy has a greater effect than castration. The effects of oestradiol and progesterone are the same as in the male but testosterone stimulates only the acinar tissue in the female.

P. C. W.

Male sexual hormone. IX. In ox blood, and in pig's prostate and testicles. S. HIRANO and R. YAMONOI. **X. In egg yolk.** S. HIRANO and K. HIRASAWA (J. Pharm. Soc. Japan, 1938, 58, 143—144, 144—145).—IX (cf. Ogata and Hirano, A., 1933, 1211, 1934, 1032). Physiological tests are recorded.

X. Allen-Doisy tests with the extracts are recorded.

A. T. P.

Effect of administration of testosterone propionate on urinary excretion of compounds allied to steroid hormones. N. H. CALLOW, R. K. CALLOW, and C. W. EMMENS (J. Endocrinol., 1939, 1, 99—107).—The administration of testosterone propionate to male or castrated male human subjects in a dosage of 50 mg. per week or more is followed by an increased urinary output of 17-ketosteroids and of androgenic and oestrogenic material.

P. C. W.

Preventive effect of testosterone on mammary cancer in the mouse. A. LACASSAGNE and A. RAYNAUD (Compt. rend. Soc. Biol., 1939, 131, 586—588).—The injection of testosterone in young female mice of a cancer-susceptible strain, immediately after birth and continued until death 12—18 months later, prevents the appearance of the mammary carcinomata that develop spontaneously in normal females. The mammae of the treated mice are entirely male in type. This may account for the absence of carcinomata in male mice of the strain.

P. C. W.

Antagonism of testosterone propionate and oestradiol. A. C. P. RAMOS (Dtsch. med. Wschr.,

1939, 65, 1127—1128).—1 mg. of testosterone propionate annuls the action of 50 units of oestradiol on the ovaries on intramuscular injection in adult rabbits. A. S.

Testosterone propionate in mastitis. A. W. SPENCE (Lancet, 1939, 237, 820—822).—Testosterone propionate was given to 16 women with painful breasts and chronic mastitis, in doses of 25, 50, or 100 mg. twice a week for several months. Pain was relieved in 14 cases; lumps disappeared in 3 out of 12 cases and were reduced in size in 5 cases. Menstruation was suppressed in 7 cases, hypertrophy of the clitoris and atrophy of the endometrium occurred in 1 case, and 5 cases showed increased growth of hair. Control injections of olive oil relieved pain in 13 of the 24 cases before testosterone was given. C. A. K.

Effect of anol on growth of the mammary gland. E. T. GOMEZ and C. W. TURNER (Amer. J. Cancer, 1939, 37, 108—113).—Anol (*p*-hydroxypropenylbenzene) stimulates the growth of the duct system of the mammary glands of normal and castrated female rabbits, rats, and male mice. The lobule-alveolar system of the mammary gland is also stimulated. The type of gland growth produced by anol is abnormal or atypical in most instances as indicated by the irregular distribution of formed alveoli and cystically enlarged ends of ducts. When preceded by ovarian hormone stimulation, anol induces rapid hyperplasia of the peripheral ends of the ducts present. This growth is characterised by the development of normal alveolar units, cystically enlarged ends of ducts, lateral outgrowths, and occasionally small neoplasms. F. L. W.

Hormones and acne vulgaris. I. Urinary assay for and therapeutic use of androgen. T. CORNBLEET and B. BARNES (Arch. Dermatol. Syphilol., 1939, 40, 249—252).—Patients with acne excrete quantities of androgen which lie in the lower part of the range for normal controls. 46 patients with acne were treated with androgen. 24 improved somewhat, some were cured completely. 24 patients were treated with sesame oil only, the diluent material for the testosterone propionate used in the other group. 7 of these improved more than 50%. One had complete clearing of the skin. C. J. C. B.

Sex hormones in acne. I. Urinary excretion of oestrogen. II. Urinary excretion of androgenic and estrogenic substances. U. J. WILE, J. S. SNOW, and J. T. BRADBURY (Arch. Dermatol. Syphilol., 1939, 39, 195—199, 200—210).—I. For a series of 20 normal young women between the ages of 15 and 21, the urinary output of oestrogen averaged 7.7 rat units per l. For a similar series of 12 young women with severe acne, the urinary output of oestrogenic substance averaged 4.1 rat units per l.

II. A moderate increase in the urinary excretion of androgen was found in cases of acne in both sexes. A decrease in the excretion of oestrogen was noted for both sexes. The ratio of excretion of androgen to that of oestrogen was found to be almost twice as great for men with acne as for normal men and for women with acne as for normal women. These find-

ings are based, however, on average vals. for each group and do not apply to every case. C. J. C. B.

Androgens and the "colouring" of women. E. C. HAMBLEN and W. K. CUYLER (J. Amer. Med. Assoc., 1939, 113, 38).—The daily urinary excretion of androgens in brunettes was about twice that in blondes. The relation of androgens to melanin formation is discussed. C. A. K.

Δ^1 -Unsaturated steroid ketones.—See A., 1939, II, 481.

Δ^{16} -alloPregnene-3:20-dione.—See A., 1939, II, 482.

Effect of testicular lipin extracts on reticulo-histocytic system. M. TORRIOLI and E. ALLARA (Boll. Soc. ital. Biol. sperim., 1939, 14, 292—294).—Histological changes in spleen, lymphatic glands, bone medulla, testes, and pituitary gland (rabbit) are described and discussed. F. O. H.

Effect of castration on body weight and length. H. S. RUBINSTEIN, A. R. ABARBANEL, and A. A. KURLAND (Proc. Soc. Exp. Biol. Med., 1939, 40, 408—409, and Endocrinol., 1939, 25, 397—400).—Male rats were castrated at 22 days and killed at 80 days. The castrates were slightly shorter and lighter than controls. V. J. W.

Presence of α -amino-acids in the spermato-phores of Paguridæ. M. HAMON (Compt. rend. Soc. Biol., 1939, 131, 109—110). P. C. W.

Contents of vesiculæ seminalis. M. PEREZ (Boll. Soc. ital. Biol. sperim., 1939, 14, 301—304).—The fluid in man has contents of Na and Ca approx. equal to those of the blood; the content of glucose and, to a greater extent, of total N is much lower (cf. Stolfi, A., 1936, 1287). F. O. H.

Changes in the prostate caused by high-frequency current. L. A. MASLOW and E. MARTOS (Arch. Path., 1939, 28, 371—376).—Tissue particles obtained by transurethral prostatic resection show considerable distortion. The changes occur in three layers: a charred thin superficial layer, a spongy coagulative layer of varying width, and a wider layer which becomes homogeneous in varying degrees. The alveolar epithelium becomes much elongated, thread-like, and packed in close bundles. Knowledge of the nuclear elongation is important because it may lead to diagnostic mistakes. The degree of the changes produced seems to be independent of the strength of the current but seems to be dependent on the moisture content of the tissue. (4 photomicrographs.) C. J. C. B.

Relationships between primary and secondary sex organs of rat. R. BAUM and B. CUNNINGHAM (Endocrinol., 1939, 21, 345—354).—Removal of the seminal vesicles or of the prostate in rats does not increase the growth rate of the testes. A. S.

Histology of testis of *Columba domestica* in normal and pathological conditions (starvation and beriberi). V. CAPRARO (Arch. Ist. Biochim. Ital., 1939, 11, 119—160).—Avitaminosis- B_1 in pigeons does not cause histological changes in testicular tissue; changes occurring during pathological conditions are

non-sp. An abnormal type of spermatogenesis is described. F. O. H.

Function of testis and stomach movement. Y. IKEGAMI (Jap. J. Gastroenterol., 1938, 10, 103—105).—Castration of mature cocks causes weakening of stomach movements which can be restored by injections of male hormone although it has no effect on normal gastric movements. F. R. SE.

Cryptorchidism. W. W. JOHNSON (J. Amer. Med. Assoc., 1939, 113, 25—27).—544 cases of undescended testes were seen in a population of boys aged 7 to 17 years (incidence 1.72%). In 313 cases spontaneous descent occurred, mostly between 11 and 13 years. Most of the remaining cases could not be followed up. The assessment of surgical and endocrine therapy must be correlated with these facts. C. A. K.

Cryptorchidism treated with gonadotropic preparations. III. Surgical repair of cryptorchidism with and without gonadotropic therapy. J. A. BIGLER, L. M. HARDY, and H. W. SCOTT (Amer. J. Dis. Child., 1938, 56, 989—996).—In children with cryptorchidism requiring surgical repair, slightly better results were obtained when a gonadotropic substance was given before operation than when operation alone was resorted to. Post-operative treatment with a gonadotropic principle had no beneficial effects on the testes which had been operated on, either in preventing or in correcting atrophy. The best results seemed to occur between the ages of 7 and 10 years with all forms of treatment. C. J. C. B.

Effect of thionine and pyocyanine on development of fertilized eggs of *Paracentrotus lividus*. R. DEOTTO (Boll. Soc. ital. Biol. sperim., 1939, 14, 327—329).—Thionine and pyocyanine in concns. of approx. 2—6 p.p.m. accelerate the development of the eggs. F. O. H.

Catalase in eggs of silkworm (*Bombyx mori*, L.). T. NAKASONE (Bull. Sericult. Japan, 1938, 11, 69—79).—Seasonal and environmental changes in catalase content of the eggs are discussed. The catalase, which is more sensitive to light than to heat, has an optimum temp. of 10—20°, the actual val. (and also the activity of the enzyme) varying with the stage of embryonic development. F. O. H.

Physical properties of amniotic and allantoic fluids of sea-turtle embryo. G. IMAMURA (J. Biochem. Japan, 1939, 29, 403—407).—Data for vol., p_H , and osmotic pressure of the fluids at various periods of incubation are given and discussed. F. O. H.

Embryonic chemistry of sea-turtle. G. IMAMURA (J. Biochem. Japan, 1939, 29, 391—402).—Data for the wt. of whole egg, shell, embryo, egg-white, yolk, and allantoic and amniotic fluid, and for the p_H of the last four, at daily intervals of 50-day incubation are tabulated and discussed. F. O. H.

Gynaecologic problems of the adolescent girl. E. ALLEN (Amer. J. Dis. Child., 1939, 58, 162—167).—A general review. C. J. C. B.

(xiii) DIGESTIVE SYSTEM.

Vitamin-B complex and functional chronic gastro-intestinal malfunction. H. BORSOOK, P. DOUGHERTY, A. A. GOULD, and E. D. KREMERS (Amer. J. digest. Dis., 1938, 5, 246—251).—227 cases were studied for from 3 months to 4 years. Improvement was obtained in most cases with continued ingestion of 500—100 i.u. of vitamin-B and 300 units of B_2 complex. C. J. C. B.

Vitamins in relation to gastro-intestinal diseases. M. G. VORHAUS (Amer. J. digest. Dis., 1938, 5, 405—408).—A general review. C. J. C. B.

Relation of nutrition to gastric function. I. Experimental method. J. H. ROE and H. M. DYER (Proc. Soc. Exp. Biol. Med., 1939, 41, 603—606).—After ligation of the duodenum in the rat the gastric secretion is aspirated at intervals after injection of mecholyl or histamine. V. J. W.

Endocrines in relation to gastro-intestinal tract. J. B. COLLIP (Amer. J. digest. Dis., 1938, 5, 587—590).—A review. C. J. C. B.

Psychiatric contributions to study of gastro-intestinal system. E. D. BOND (Amer. J. digest. Dis., 1938, 5, 482—486).—A review. C. J. C. B.

Factors which reduce gastric acidity. F. HOLLANDER (Amer. J. digest. Dis., 1938, 5, 364—372).—A crit. review. C. J. C. B.

Effect of oestrogenic hormone on gastric acidity. L. SCHIFF, H. FELSON, J. GRAFF, and B. MEYER (Amer. J. digest. Dis., 1938, 5, 292—294).—The intramuscular administration of theelin (3000—10,000 units daily) for 15—167 days has no effect on the gastric acidity of man within a total observation period of 2—13 months. C. J. C. B.

Gastric secretion in extragastric malignancy. H. NECHELES, M. APPEL, D. WALD, and W. OLSON (Amer. J. digest. Dis., 1939, 6, 261—263).—Gastric secretion was investigated in 16 rabbits with Brown-Pearce tumours. No alteration in gastric acidity or pepsin was observed even in animals with extensive carcinomatosis. C. J. C. B.

Method for continuous recording of gastric p_H in situ. J. FLEXNER, M. KNIAZUK, and J. NYBOER (Science, 1939, 90, 239—240).—A Ag—AgCl electrode is introduced into the stomach and a continuous p_H record obtained. A 2nd stomach tube is used for maintaining the stomach contents continually mixed. W. F. F.

Characteristics of certain experimentally produced anomalies of gastric secretory curve. C. M. WILHILM, R. W. FINEGAN, and D. E. BACA (Amer. J. digest. Dis., 1939, 6, 73—80).—3 types of hyperacidity and 2 types of hypoacidity were observed or produced experimentally in dogs. The characteristics of each type are described. C. J. C. B.

Inhibition of gastric secretion by extracts of normal male urine. J. S. GRAY, E. WIECZOROWSKI, and A. C. IVY (Science, 1939, 89, 489—490).—The chemical and biological properties of the inhibitory substance in urine resemble those of duodenal preps. of enterogastrone. W. F. F.

Gastric secretory curve before and after Mann-Williamson operation, and its bearing on normal regulation of gastric acidity. C. M. WILHELMJ and R. W. FINEGAN (*Amer. J. digest. Dis.*, 1938, 5, 373—377).—Following the Mann-Williamson operation the acidity of the total secretions entering the stomach is much higher than before operation. During the gastric secretory curve, the acidity of the secretions continues to rise and does not show a terminal decrease. The non-acid secretions entering the stomach are either very small in amount or absent. These changes are due to the absence of duodenal regurgitation. The emptying time of the stomach is markedly increased after operation owing apparently to jejunal spasm.

C. J. C. B.

Experimental study of chemical inhibitors of gastric acidity. F. D. MANN and F. C. MANN (*Amer. J. digest. Dis.*, 1939, 6, 322—325).—Transitory achlorhydria to histamine may be produced in dogs by exposure of the gastric mucosa to dil. solutions of Hg^{II} or Cu^{II} salts; no effect was noted using salts of Pb, Mn, and Zn in much greater concn. Quinone has a similar inhibiting action, whilst quinol and resorcinol have no effect in 100 times as great concn. Brilliant-green and crystal-violet stain the gastric mucosa and inhibit acid secretion.

C. J. C. B.

Physiological control of normal human gastric secretory curve. C. M. WILHELMJ and A. SACHS (*Amer. J. digest. Dis.*, 1939, 6, 467—474).—A review of the authors' previous work.

C. J. C. B.

Effect of vitamin- B_1 [on gastric juice]. E. GANASSINI (*Boll. Soc. ital. Biol. sperim.*, 1939, 14, 467—468).—Vitamin- B_1 (3000 i.u.), orally administered to dogs with gastric fistulae, increases the vol. of gastric juice; the effect is due to direct action on the secretory glands and also to stimulation of the vagus nerve-endings.

F. O. H.

Gastric elimination of sodium chloride and sulphate following intravenous injection of hypertonic solutions of the two salts. I. SIMON (*Boll. Soc. ital. Biol. sperim.*, 1939, 14, 448—449).—The concn. of NaCl in the gastric juice (rabbit) after injection of 70 c.c. of N-NaCl per kg. reaches a level (6.76—8.59%) greater than that in blood or tissues; Na_2SO_4 , similarly injected, attains a level (1.039—1.107%) less than that in blood or tissues.

F. O. H.

Occurrence of pieces of sloughed gastric mucous membrane in aspirated gastric juice. J. C. HAWKSLEY (*J. Path. Bact.*, 1939, 49, 585—587).—Pieces of sloughed gastric mucous membrane were found in the aspirated gastric juice of 21 out of 200 consecutive gastroscopies. (3 photomicrographs.)

C. J. C. B.

Effect of nicotinic acid on gastric secretion. C. M. VALERI and P. PATERNO (*Boll. Soc. ital. Biol. sperim.*, 1939, 14, 377—378).—The constituents of gastric juice are not modified in human achylia by injection of nicotinic acid; when gastric secretion is normal, nicotinic acid has a histamine-like effect.

F. O. H.

Inhibitory effect of urine extracts on gastric secretion. M. H. F. FRIEDMAN, R. O. RECK-

NAGEL, D. J. SANDWEISS, and T. L. PATTERSON (*Proc. Soc. Exp. Biol. Med.*, 1939, 41, 509—511).—Normal urine extracts contain a substance which inhibits histamine secretion of gastric juice. The substance withstands a temp. of 99° for 1 hr. but is destroyed after 4 hr.

V. J. W.

Studies on man with new secretagogue meal [meat extract]. R. UPHAM and F. SPINDLER (*Amer. J. digest. Dis.*, 1939, 5, 721—725).—The use of a meat extract meal is recommended as exact and const.

C. J. C. B.

Modern conception of gastric secretory functions. S. MORRISON (*Amer. J. digest. Dis.*, 1938, 5, 617—627).—A crit. review.

C. J. C. B.

Modification of Anson and Mirsky's hæmoglobin method for determination of pepsin by gastric drainage. J. M. BEAZELL, C. R. SCHMIDT, A. C. IVY, and J. F. MONOGHAN (*Amer. J. digest. Dis.*, 1938, 5, 661—663).

C. J. C. B.

Triple mechanism of chemical phase of gastric secretion. B. P. BABKIN (*Amer. J. digest. Dis.*, 1938, 5, 467—472).—A crit. review.

C. J. C. B.

The gastro pump. S. A. SELEY (*Amer. J. digest. Dis.*, 1938, 5, 360—361).—An apparatus consisting of 2 bottles with valved rubber ball syringes is described. It is useful for gastric lavage, for duodenal intubation, for Lyons-Meltzer drainage, for withdrawal of ascitic fluid in abdominal paracentesis, and for irrigation of the urinary bladder, chest, or other organs.

C. J. C. B.

Absorption of hydrochloric acid by human stomach. H. SHAY, J. GERSHON-COHEN, and S. S. FELS (*Amer. J. digest. Dis.*, 1939, 6, 361—363).—2 tubes were passed, one into the stomach and the other into the duodenum. Olive oil was passed into the duodenum continuously to arrest gastric emptying. Various concns. of HCl were passed into the stomach. 0.5—1% HCl is not absorbed from the stomach over 30 min. 1% HCl completely inhibits gastric secretion whilst 0.5% HCl causes partial inhibition.

C. J. C. B.

Gastric absorption of phenol-red in man. A. PENNER, F. HOLLANDER, and M. SALTZMAN (*Amer. J. digest. Dis.*, 1938, 5, 657—661).—By the use of a known non-absorbable reference standard ($Fe^{III} NH_4$ sulphate) it is shown that phenol-red is not absorbed from the human stomach, in health or disease. Phenol-red is not altered chemically by its contact with gastric secretions and does not preferentially stain the mucous membrane. Phenol-red is thus satisfactory as a dilution indicator in gastric analysis in man.

C. J. C. B.

Control of gastric hyperacidity by magnesium trisilicate. C. G. REID (*Amer. J. digest. Dis.*, 1939, 6, 267—270).—Mg trisilicate is a satisfactory substitute for the alkalis commonly employed to control gastric hyperacidity; in the same dosage it is slightly less prompt in its neutralising action, but its effect is more prolonged.

C. J. C. B.

Present status of treatment in chronic gastritis; gastroscopic observations. W. A. SWALM

and L. M. MORRISON (Amer. J. digest. Dis., 1938, 5, 472—482).—A review. C. J. C. B.

[Phenolphthalein] test for determining presence of gastro-intestinal lesions. E. E. WOLDMAN (Amer. J. digest. Dis., 1938, 5, 221—224).—0.1 g. of phenolphthalein dissolved in alcohol is given by mouth and the urine tested 2—4 hr. later for free phenolphthalein by the addition of 10% NaOH. A positive reaction indicates damage to the intestinal mucous membrane. In 113 cases the error was less than 3% for both positive and negative findings. The urine must be examined promptly.

C. J. C. B.

Value of Woldman's phenolphthalein test for gastro-intestinal lesions. L. J. NOTKIN, E. KIRSCH, and S. ALBERT (Amer. J. digest. Dis., 1939, 6, 365—366).—40% of 105 unselected cases with different diseases gave positive tests, indicating that this test is not pathognomonic for gastro-intestinal disease. 30% of 13 cases with gastro-intestinal disease gave persistent negative tests. C. J. C. B.

Treatment of peptic ulcer with colloidal aluminium hydroxide. E. R. KYGER, jun., E. H. HASHINGER, and E. W. WILHELMY (Amer. J. digest. Dis., 1939, 6, 363—364).—40% of 40 cases showed complete X-ray healing in 99 days while a further 22% showed the appearances of healed scar.

C. J. C. B.

Bleeding peptic ulcer. G. C. TURNBULL and J. H. SAGI (Amer. J. digest. Dis., 1939, 6, 92—96).—A review of 80 cases. C. J. C. B.

Management of peptic ulcer hæmorrhage. D. C. BROWNE and G. McHARDY (Amer. J. digest. Dis., 1939, 6, 87—92).—A review. C. J. C. B.

Use of food in treatment of bleeding peptic ulcer (Meulengracht diet). W. D. MAYER and J. J. LIGHTBODY (Amer. J. digest. Dis., 1939, 6, 108—110).—The 79 patients treated improved more rapidly than those treated by the starvation method.

C. J. C. B.

Urinary elimination of free phenolphthalein no test for gastro-intestinal ulceration. F. STEIGMANN and J. M. DYNIEWICZ (Amer. J. digest. Dis., 1939, 6, 120—122).—Free phenolphthalein generally appears in the urine, whenever the quantity of conjugated phenolphthalein in any one specimen exceeds 5 mg. per 100 c.c. of urine. In some abnormal individuals, e.g., cardiac, renal cases, and blood dyscrasias, free phenolphthalein appears at an even lower concn. than 5 mg.-%. As many pathological non-ulcer cases and normal individuals obtain such concn. after the ingestion of 0.1 g. of phenolphthalein in 10 c.c. of 95% alcohol, the appearance of free phenolphthalein in the urine cannot be considered a diagnostic test for gastro-intestinal ulceration.

C. J. C. B.

Use of hydrated magnesium trisilicate in peptic ulcer. M. KRAEMER (Amer. J. digest. Dis., 1938, 5, 422).—All of 38 patients improved under this treatment.

C. J. C. B.

Phenolphthalein as test for gastro-intestinal ulceration in experimental animal. B. SLUTZKY and C. M. WILHELMY (Amer. J. digest. Dis., 1939, 6,

449—450).—The test was unreliable; 3 out of 5 acute surgical gastric ulcers gave negative tests.

C. J. C. B.

Gastric ulcer caused by aspirin. M. SHIMAMURA and A. AOKI (Folia pharmacol. japon., 1939, 27, 19).—Subcutaneous or gastric administration of aspirin to mice and rats often causes gastric ulcer and hæmorrhage. If NaHCO₃ is mixed with the aspirin hæmorrhages or ulcers do not develop. Salicylic and acetic acids cause hæmorrhage and ulcers only after oral administration and not after subcutaneous injection. The severity of the ulcers and hæmorrhage increases with increasing amounts of aspirin; the effects are more pronounced in rats than in mice.

J. N. A.

Diabetes mellitus and peptic ulcer. R. E. ROTHENBERG and I. TEICHER (Amer. J. digest. Dis., 1938, 5, 663—667).—In a group of 3525 diabetic patients, peptic ulcer was present in 9 cases, an incidence of 0.25%. Of 130,500 total hospital admissions, 1952 patients or 1.49% had peptic ulcer. Both diabetes mellitus and peptic ulcer were present in 51 cases out of a group of 10,397 diabetic patients collected from reports in the literature.

C. J. C. B.

Use of aluminium hydroxide gel in treatment of peptic ulcer. E. S. EMERY and R. B. RUTHERFORD (Amer. J. digest. Dis., 1938, 5, 486—492).—12 patients with peptic ulcer were treated by colloidal Al(OH)₃, given orally by a combination of a continuous drip and oral method; the gastric contents can be then neutralised completely. Relief of pain occurred within 24 hr. The drug also decreased titratable acidity. Patients with a marked hypersecretion were brought under satisfactory control. No adverse effects have been noted. C. J. C. B.

Level of ascorbic acid in blood and urine of patients with peptic ulcer. D. T. CHAMBERLIN and H. J. PERKIN (Amer. J. digest. Dis., 1938, 5, 493—497).—Patients in bed on ulcer management have lower levels of ascorbic acid in the blood and urine than normal individuals or patients with functional digestive disorders. The amount of additional vitamin-C required to raise the excretion of ascorbic acid to normal in patients with peptic ulcer is 50 mg. 4 times a day but there is no evidence of the val. of -C in treatment. C. J. C. B.

Vagotomy plus partial gastrectomy for duodenal ulcer. A. WINKELSTEIN and A. A. BERG (Amer. J. digest. Dis., 1938, 5, 497—501).—Following subphrenic anterior vagotomy plus partial gastrectomy, achlorhydria, immediate or late, was induced in 26 of 34 patients with duodenal ulcer and high preoperative acidity. C. J. C. B.

Effects of acetylcholine, acetyl-β-methylcholine, and prostigmine on secretion of stomach of man and dog. H. NECHELES, W. G. MOTEL, J. KOSSE, and F. NEUWELT (Amer. J. digest. Dis., 1938, 5, 224—231).—Acetylcholine increased acid, vol., and pepsin secretion of the Heidenhain pouch. 50 mg. of acetylcholine iodide injected every 10 min. did not exhaust secretion for 7 hr. Acetyl-β-methylcholine in small and large doses increased acid and vol. secretion of the pouch. Large doses effected a pre-

liminary inhibition of secretion followed by a greater secretory response than that to smaller doses. Acetylcholine or acetyl- β -methylcholine and histamine were synergists relative to gastric secretion. A depression of secretion appeared after one of them was discontinued, followed by recovery. Large doses of acetyl- β -methylcholine depressed histamine-pilocarpine secretion. Prostigmine and prostigmine + acetylcholine increased acid secretion in the Heidenhain pouch. Acetyl- β -methylcholine stimulated gastric secretion of vol., acid, and pepsin in normal subjects; prostigmine stimulated secretion of fluid and acid. C. J. C. B.

Gastro-intestinal pathology in dogs following administration of acetylcholine and pitressin. H. NECHELES and W. MASUR (Amer. J. digest. Dis., 1939, 6, 389—391).—In dogs repeated injection of acetylcholine is followed by a hæmorrhagic condition of the upper part of the gastro-intestinal tract; repeated injection of pitressin is followed by a hæmorrhagic condition of the entire gastro-intestinal tract, especially of the lower ileum and colon. C. J. C. B.

Effects of anæsthetics on response of submaxillary and pancreatic glands to prostigmine and physostigmine. P. J. CRITTENDEN (Proc. Soc. Exp. Biol. Med., 1939, 41, 367—370).—Secretory response is much less under paraldehyde or chloralose than under pentothal. The response to prostigmine under pentothal falls off when the prostigmine dose exceeds 0.06 mg. per kg. V. J. W.

Simultaneous observations of pancreatic and biliary papillæ of rabbit. J. AUER and L. D. SEAGER (Proc. Soc. Exp. Biol. Med., 1939, 41, 481—482).—Secretin, cholecystokinin, acetylcholine, and arecoline increase the contractions of the pancreatic more than those of the biliary papilla. Histamine does the reverse; physostigmine affects both equally, and adrenaline and atropine inhibit both. V. J. W.

Experimental pancreatic fistula. J. M. McCAUGHAN (Amer. J. digest. Dis., 1939, 6, 392—395).—The previous operative methods are reviewed and a new method of retrograde external fistula detailed. C. J. C. B.

Cystic fibrosis of pancreas and its relation to cœliac disease. D. H. ANDERSEN (Amer. J. Dis. Child., 1938, 56, 344—399).—49 cases of pancreatic fibrosis in infants or older children on whom post-mortem examination was done have been collected and analysed. 45 were cases of cystic fibrosis of the pancreas and in 4 the acinar tissue of the pancreas was replaced by adipose tissue. (10 photomicrographs.) C. J. C. B.

Use of nitroglycerin in immediate treatment of acute non-hæmorrhagic pancreatitis. R. ELMAM (Amer. J. digest. Dis., 1939, 6, 474—475).—The case reported recovered dramatically after inhaling 1 ampoule of amyl nitrite and 3 tablets of $\frac{1}{200}$ grain of nitroglycerin. C. J. C. B.

Diastase activity of blood and urine when pancreatic ducts are permanently closed. L. A. GOLDEN, L. A. SIERACKI, M. B. HANDELSMAN, and J. H. PRATT (Amer. J. digest. Dis., 1939, 6, 327—331).—The permanent separation of the pancreas from the

duodenum with the resulting permanent occlusion of all the pancreatic ducts in the dog resulted in a persistent increase of blood-diastase in 3 out of 4 animals. The pancreas at autopsy was nevertheless found reduced to a small mass in which few acinar cells could be demonstrated. There was no relation between the blood- and urine-diastase. There was a little diastase present in the urine during the 1st week after duct occlusion, but after the 2nd week the urine was usually free from diastase although the blood-diastase was high. C. J. C. B.

Use of secretin as clinical test of pancreatic function. J. S. DIAMOND, S. A. SIEGEL, M. B. GALL, and S. KARLEN (Amer. J. digest. Dis., 1939, 6, 366—372).—Intravenous injection of secretin (0.5 mg. per kg.) in man is immediately followed by an increased vol. of secretion, a high concn. of HCO_3' , and an increased output of all the enzymes; the response is proportional to body-wt. In pathological conditions one or more of the functions may be impaired. The normal ranges were: vol. 2.5—3.8 c.c. per kg. over 80 min.; concn. of HCO_3' 2.5—3.8 c.c. per kg. body-wt.; diastase 6.1—13.4 units per kg.; trypsin 0.4—0.8 units per kg.; lipase 152—231 units per kg. C. J. C. B.

Variations in level of serum-lipase in experimental pancreatitis. H. BAXTER, S. G. BAXTER, and J. F. McINTOSH (Amer. J. digest. Dis., 1938, 5, 423—426).—Following the injection of bile into the major pancreatic duct of 7 dogs, there was a prompt rise in the serum-lipase which reached a max. in 24—48 hr. After reaching a peak it subsided abruptly at first and then more gradually until normal level was reached (7—10 days). The changes found at autopsy varied from a typical acute hæmorrhagic pancreatitis with necrosis to slight focal areas of fibrosis and round cell infiltration. (2 photomicrographs.) C. J. C. B.

Discussion on diagnosis and treatment of acute pancreatitis. J. MORLEY, H. B. YATES, W. H. OGILVIE (Proc. Roy. Soc. Med., 1939, 32, 670—681).—Gall-stones are frequently responsible for pancreatitis; another cause might be proliferative metaplasia of pancreatic duct epithelium. Increase in the urinary diastase occurs early and is of diagnostic importance. W. J. G.

Concentration of pancreatic enzymes in duodenum of normal persons and persons with disease of upper abdomen. M. W. COMFORT, R. L. PARKER, and A. E. OSTERBERG (Amer. J. digest. Dis., 1939, 6, 249—254).—The concns. of amylase and trypsin in duodenal contents normally varied 10-fold; that of lipase varied 50-fold. The concn. of amylase, trypsin, and lipase was normal in intrahepatic jaundice caused by cirrhosis or hepatitis, obstructive jaundice caused by a stone in, or a stricture of, the common bile duct, biliary disease which is associated with or a residuum of acute œdematous pancreatitis, and non-tropical sprue. Diminution or absence of amylase, trypsin, and lipase in the duodenal contents was found in patients with carcinoma of the head of the pancreas, carcinoma of the ampulla of Vater, and chronic atrophic pancreatitis with steatorrhœa. C. J. C. B.

Osmotic relationships between blood plasma and intestinal fluid during absorption. R. R. ROEPKE and M. B. VISSCHER (Proc. Soc. Exp. Biol. Med., 1939, 41, 500—503).—Osmotic pressure of a saline solution, or blood serum, placed in an isolated loop of the dog's intestine falls and may reach half an atm. below that of the blood. V. J. W.

Availability of manganese in avian digestion. H. S. WILGUS, jun. and A. R. PATTON (Science, 1939, 89, 393).—Dialysis of the intestinal contents of White Leghorn pullets showed that Mn is rendered less diffusible by addition of excessive amounts of steamed bone meal to the diet. The addition of less than 0.2% Fe^{III} citrate to the basal diet also caused severe perosis. The *in vivo* experiments are supported by *in vitro* observations on Mn pptn. W. F. F.

Absorption of protein introduced by tube into human duodenum. I. GRAY and M. WALZER (Amer. J. digest. Dis., 1938, 5, 345—348).—Following the intra-duodenal administration of a peanut test meal, the rate of absorption of unaltered peanut protein is more rapid by several min. than the rate following its oral consumption. In patients with gastric hyperacidity the absorption rate from the duodenum is not as rapid as, whilst in patients with gastric hypoacidity the absorption rate is more rapid than, in patients with normal gastric acidity. C. J. C. B.

Effect of duodenal instillation of hydrochloric acid on fasting blood-sugar of dogs. E. R. LOEW, J. S. GRAY, and A. C. IVY (Amer. J. Physiol., 1939, 126, 270—276).—Intraduodenal administration of 50—100 c.c. of 0.3% HCl did not lower the fasting blood-sugar level in unanæsthetised dogs (2 completely gastrectomised with jejuno-oesophageal anastomosis, 4 with duodeno-oesophageal anastomosis and pouches of the entire stomach, and a 3rd group of normal intact dogs) in nembutalised intact dogs, or in nembutalised dogs with acutely inactivated adrenal glands. M. W. G.

Influence of lactate on absorption of glucose from the intestine of adrenalectomised rats. L. LASZT (Nature, 1939, 143, 984).—Na lactate, like pyruvate, restores to normal level the low glucose absorption from the intestine of adrenalectomised rats. W. F. F.

Influence of sodium chloride on glucose absorption from the intestine of iodoacetate-poisoned rats. L. LASZT (Nature, 1939, 144, 244).—The inhibiting effect of iodoacetate on sugar absorption is suppressed after NaCl administration. The general toxic effect of the iodoacetate on the rat is counteracted in the same way by NaCl. W. F. F.

[Effect of adrenal cortex on] lipin secretion by intestinal mucosa. G. LIGUORI (Boll. Soc. ital. Biol. sperim., 1939, 14, 445—446).—Subcutaneous injection of hormone preps. of the adrenal cortex increases the secretion of lipins into a Thiry-Vella fistula (dog). F. O. H.

Distribution of fatty acids in halibut intestinal oil. Free fatty acids in the intestines of fish. J. A. LOVERN and R. A. MORTON (Biochem. J., 1939,

33, 1734—1739).—Both vitamin-A and cholesterol are esterified with all the fatty acids present in halibut intestinal oil; the proportions vary with the relative amounts of the acids present. The phosphatide-fatty acids differ appreciably in that they contain more palmitic and stearic acids but less C₁₈, C₂₀, and C₂₂ unsaturated acids; they do not appear to be concerned with the transport of absorbed fat in the intestine. Some free fatty acid is present even before autolysis has taken place. P. G. M.

Digestion and absorption in man with 3 feet of small intestine. E. S. WEST, J. R. MONTAGUE, and F. R. JUDY (Amer. J. digest. Dis., 1938, 5, 690—692).—Digestion and absorption in a man with 3 ft. of small intestine was studied over a 7-day period. The assimilation of carbohydrate was normal. 25% of the ingested protein and 45% of the fat were lost in the faeces, representing 25% of the calorific val. of the ingested food. The faecal fat contained a large proportion of free fatty acids, indicating satisfactory digestion of fat and poor absorption of fatty acids. A high Ca and viosterol intake was necessary to keep the man in positive Ca balance. The large amount of fatty acids in the faeces was chiefly responsible for the poor Ca absorption; the const. daily ratio of faecal Ca to faecal fat supports this explanation. C. J. C. B.

Rhythmic contractions in small intestine of the dog. D. M. DOUGLAS and F. C. MANN (Amer. J. digest. Dis., 1939, 6, 318—322).—Exteriorised loops were prepared at various levels in the small bowel of trained dogs and the occurrence and rate of rhythmic contractions noted. Rhythmic contractions were rare, occurring in 2% of all tracings. The remaining 98% were irregular types of segmentation, peristaltic, and tonus waves. The rate of rhythmic contractions was const. for any given loop with a variation of ± 1 contraction per min. The rate of any given loop was a function of its distance from the pylorus, the loop at the highest level having the highest rate. The rate was not affected by fasting, feeding, or sleep, except that in the recently fed animal, rhythmic contractions were less common than in the fasting animal. The rate was unaffected by vagal and splanchnic section. C. J. C. B.

Variations in enzymic activity of duodenal contents. V. C. MYERS, A. H. FREE, and A. J. BEAMS (Amer. J. digest. Dis., 1938, 6, 464—467).—A system of enzyme analysis is described which permits an accurate estimation of proteolytic, lipolytic, and amylolytic activity of the enzymes of duodenal contents. 23 cases are studied. Very low vals. of enzyme activity are found in pancreatitis and certain other conditions; subnormal vals. are encountered in various gastro-intestinal disorders which may have an effect on the pancreas. In diabetes, the enzyme activity may be subnormal or elevated. C. J. C. B.

Determination of p_H of body fluids [by measuring p_H of colonic contents in faeces]. A. W. OELGOETZ (Amer. J. digest. Dis., 1938, 5, 311—312).—If water at known p_H is introduced into the colon and withdrawn in 20 min. its p_H normally is 7.2; in patients with alkalosis it is on the alkaline side and

in patients with acidosis on the acid side of this val. An easier method is to determine the p_H of fresh faeces obtained by injection of pitressin. The variation of p_H from the normal indicates the presence of acidosis or alkalosis. C. J. C. B.

Biophotometric studies in 30 cases of chronic ulcerative colitis. H. H. LERNER and H. G. RAPAPORT (Amer. J. digest. Dis., 1939, 6, 239—242).—Of 30 cases of ulcerative colitis 41% had a sub-clinical vitamin-A deficiency (twice the normal expectancy). The phase of the disease, "acute," "interval," or "healed," did not influence the occurrence of the -A deficiency. Acutely ill patients receiving massive doses of -A show normal dark adaptation, while chronically ill and healed patients show deficient dark adaptation. C. J. C. B.

Decompression of small bowel in intestinal obstruction. R. J. NOER and V. G. JOHNSTON (Amer. J. digest. Dis., 1939, 6, 46—49).—The device consists of a 10-ft. tube with a balloon at the end which can be inflated and deflated at will. After being passed into the duodenum, the balloon is inflated; it is propelled onwards by peristalsis, dragging the remainder of the tube after it. The tip of the tube can thus be passed to the point of obstruction in organic lesions or throughout the small intestine in cases of partial obstruction or paralytic ileus. C. J. C. B.

Effect of parenterally administered drugs on colon of dog. L. H. WOLFF (Amer. J. digest. Dis., 1939, 6, 243—249).—The effects of drugs on the motility of the colon were determined in trained unanæsthetised dogs with Thiry or Vella colonic fistulae. Records were obtained by means of rubber balloons and a const.-pressure apparatus. Ca salts, eserine, and hypertonic solutions of NaCl and acetylcholine increased tone and motility. Pituitrin, pitressin, ephedrine, histamine, and adrenaline, and especially pitocin, decreased tone and motility. Hypertonic solutions of glucose and parathyroid extract had little effect. Eserine + ephedrine produced marked stimulation of colonic motility, as did eserine + acetylcholine. C. J. C. B.

Does rabbit chew the cud? (A) H. MADSEN. (B) E. L. TAYLOR (Nature, 1939, 143, 981—982, 982—983).—(A) Two sorts of faeces are produced in a day/night rhythm.

(B) The rabbit practises physiological refection, and between one third and one half of its stomach contents are of faecal origin. The bearing of this fact on metabolism experiments in the rabbit is important. W. F. F.

Cod-liver oil per rectum as adjunct in treatment of ulcerative colitis. R. R. BEST (Amer. J. digest. Dis., 1938, 5, 426—428).—Daily instillations of 2—4 oz. were used. Of 17 cases treated, 13 remained practically symptom-free for 3—22 months. Only 2 showed marked residual ulceration while being otherwise symptom-free. Several showed incomplete healing. C. J. C. B.

Relationship of diet to self-regulatory defence mechanism. I. Hydrogen-ion concentration and bacterial flora. N. P. SULLIVAN and I. A.

MANVILLE (Amer. J. digest. Dis., 1938, 5, 428—432).—The addition of dehydrated apple to the diet of the rabbit raises the $[H^+]$ of the intestinal contents. The intestinal flora were changed from one in which *Esch. coli* predominated to one in which the acidophilic type of organism was dominant; the no. of gas-producing organisms was reduced. The addition of apple to the diet of both rabbits and rats for 42 days did not alter the cellulose-splitting flora. C. J. C. B.

Activity of lower part of ileum of dog in relation to ingestion of food. D. M. DOUGLAS and F. C. MANN (Amer. J. digest. Dis., 1939, 6, 434—439).—The activity of exteriorised loops of the lower part of the ileum in continuity, enclosed in bipediced tubes of skin, was studied in the dog in relation to the ingestion of food. In the normal animals a rapid motor response to feeding was followed by prolonged activity which gradually diminished until, after 48 hr. of fasting, the activity was extremely feeble. The motor response occurred after feeding by gastric fistula and after double thoracic vagotomy. Partial interruption of continuity by a short-circuiting operation gave inconst. results. Complete isolation of the loop abolished the motor response to feeding and led to complete dissociation of the activity of the loop from the ingestion of food. C. J. C. B.

Cæcectomy of chicks and effect on their growth and infectability with intestinal flagellates. F. L. RICHARDSON (Amer. J. Hyg., 1939, 30, c, 69—71).—Cæca were removed from 7 chicks, 8—13 days old. After 9 weeks their wts. were normal as compared with control chicks. The cæcectomised chicks did not become infected with either *Trichomonas* or *Chilomastix*, when kept in contact with parasitised chicks or when inoculated with cæcal material containing large nos. of the flagellates. B. C. H.

Histamine in human faeces. G. MYHRMAN and J. TOMENIUS (Arch. exp. Path. Pharm., 1939, 193, 14—23).—The histamine content of normal human faeces determined by Barsoum and Gaddum's method was 0—4 μ g. per c.c.; in asthma it rose to 96 μ g. per c.c. It was decreased by oral administration of Fe. H. O. S.

Significance of presence of calcium bilirubin pigment and cholesterol crystals in faeces. F. BOERNER, T. A. JOHNSON, and M. GIANNINY (Amer. J. digest. Dis., 1939, 6, 466—467).—Of 36 cases in which such pigment or crystals were found in the faeces, 19 were shown to have cholelithiasis. C. J. C. B.

Abnormalities in tone and contraction of rectum in paraplegia and hemiplegia. S. J. ROSENBERG and O. R. LANGWORTHY (Amer. J. digest. Dis., 1939, 6, 455—458).—Graphic records showing the reactions of the rectum to distention with air were made in normal individuals and in hemiplegic and paraplegic patients. The normal rectal wall often contracts in response to sudden stretch; rhythmic waves of contraction are also elicited by distention which may become of sufficient strength to expel the balloon. These responses were in general more marked in individuals with injury of the corticospinal

tracts, owing to a release of the rectal wall from the normal inhibitory control by the cerebral motor cortex. C. J. C. B.

Hydrogen-ion concentration of human faeces, urine, and ileac dejecta. E. G. WAKEFIELD and M. H. POWER (Amer. J. digest. Dis., 1939, 6, 308—309).—When the faeces are passed in liquid form, as the result of purgatives, the p_H of the liquid portion is approx. the same as that of ileal fluids found at operation. There does not seem to be any association of the trends of p_H in the urine and faeces. C. J. C. B.

(xiv) LIVER AND BILE.

Glycogen metabolism in liver. P. OSTERN, D. HERBERT, and E. HOLMES (Biochem. J., 1939, 33, 1858—1878).—Glycogen in liver pulp is phosphorylated to glucose 1-phosphate (Cori ester), and then dephosphorylated to glucose. Hydrolysis of this ester is inhibited in the presence of NaF, and it is converted into glucose 6-phosphate (Emden ester). The production of Cori ester from glycogen is reversible. Glycogen is synthesised from glucose in liver slices. This occurs only under anaërobic conditions and not at all in liver pulp, in the absence of Ca, or in the presence of NaF. It is also partly inhibited by insulin. Not more than 15% of glycogen breakdown in liver is due to amylase activity. P. G. M.

Mechanism of urea formation. S. J. BACH (Biochem. J., 1939, 33, 1833—1844).—The possible production of urea from ornithine and citrulline via glutamic acid and glutamine is indicated. The amide group appears to be essential for its formation from glutamic acid and glutamine, since amide-N is formed in the presence of glutamic acid and partly disappears in the presence of glutamine. No urea is formed from glutamic acid in the absence of NH_3 . Amino-N remains const. during formation of urea from citrulline by liver slices in presence of NH_4 lactate, but is increased when citrulline is replaced by arginine; no ornithine is therefore formed from citrulline. NH_4 lactate alone also gives rise to urea, the formation of which from α -ketoglutaric acid and NH_4Cl is inhibited by the presence of amino-acids (glycine etc.). Evidence of the formation of urea from citrulline and α -ketoglutaric acid (or pyruvic acid) in the absence of NH_3 also suggests oxidation of citrulline to urea and glutamic acid by keto-acids. Na formate increases urea formation from glutamic acid and glutamine in presence of NH_4Cl . P. G. M.

Elimination of administered chloral hydrate in urine as test for liver function. B. MUKERJI and R. GHOSE (Nature, 1939, 144, 112—113).—Chloral hydrate is reduced to trichloroethyl alcohol in the body, conjugated with glucuronic acid, and excreted as urochloralic acid. The liver is the site of these chemical transformations in dogs. W. F. F.

Supplementary proteins and amino-acids and dietary production of fatty livers in mice. S. A. SINGAL and H. C. ECKSTEIN (Proc. Soc. Exp. Biol. Med., 1939, 41, 512—513).—Fatty livers have been produced in mice by diets shown by Tucker (A., 1938, III, 747) to produce such an effect in rats. V. J. W.

Production of fatty livers in guinea-pigs with scorbutogenic diets. M. A. SPELLBERG and R. W. KEETON (Proc. Soc. Exp. Biol. Med., 1939, 41, 570—572).—The two diets given caused scurvy and fatty degeneration of the liver, the latter not being prevented by addition of ascorbic acid. V. J. W.

Colloidal gold curve of blood serum in liver disease. S. J. GRAY (Proc. Soc. Exp. Biol. Med., 1939, 41, 470—472).—A modified Lange test shows positive results in all cases studied of cirrhosis, acute hepatitis, and hepatic neoplasms. V. J. W.

Changes in bile-cholesterol and bile acids in diseases of the liver. L. S. LIFSCHITZ (Wien. Arch. inn. Med., 1936, 29, 259—270; Chem. Zentr., 1937, i, 3172).—A lowering of the ratio of bile acid to cholesterol indicates that gallstone diathesis and cholelithiasis are related to pathological changes in the parenchyma and bile passages. A. J. E. W.

Serum-phosphatase in hepatic and biliary disorders. L. WINKLEMAN and A. SCHIFFMANN (Arch. intern. Med., 1939, 64, 348—361).—Serum-phosphatase vals. are normal or slightly raised in obstructive jaundice with severely damaged liver parenchyma, but are markedly increased in obstructive jaundice with actively functioning liver cells. C. A. K.

Vitamin-K in jaundice. H. R. BUTT, A. A. M. SNELL, and A. E. OSTERBERG (J. Amer. Med. Assoc., 1939, 113, 383—390).—See A., 1939, III, 292. C. A. K.

Prothrombin and hippuric acid determinations as indicators of liver damage. S. J. WILSON (Proc. Soc. Exp. Biol. Med., 1939, 41, 559—561).—In a no. of patients and normal subjects blood-prothrombin and hippuric acid excretion after Na benzoate were closely correlated with each other and with clinical liver condition. No correlation was found to exist with blood-fibrinogen, bromsulphalein clearance, or galactose utilisation. V. J. W.

Autolytic changes in the protein and amino-acid content of liver. J. M. LUCK, J. EUDIN, and C. C. NIMMO (J. Biol. Chem., 1939, 131, 201—209).—At p_H 5.0 the substrate for the autoproteolytic enzymes is the globulins of the salt-sol. fraction and partial denaturation into a less sol. protein present in the globulin-II fraction occurs. At p_H 7.3 globulin-II is the principal substrate, some of which is converted into more sol. globulins of the salt-sol. fraction. Autolysis and liberation of tyrosine, which undergoes a secondary reaction involving its destruction, are slower at p_H 7.3 and in both cases proteolysis is decreased by $NaIO_3$. H. G. R.

Extract fractions precipitated by trichloroacetic acid during primary autolysis of liver. M. CALCINAI (Biochim. Terap. sperim., 1939, 26, 407—416).—The water-sol. fraction of liver (guinea-pig) pptd. by trichloroacetic acid increases during the first few hr. of autolysis. This resynthesis of liver-protein is enhanced or modified by prior administration of ascorbic acid to the animal. F. O. H.

Bilirubin and urobilin content of bile. M. ROYER (Arch. intern. Med., 1939, 64, 445—456).—Bilirubin and urobilin contents of bile obtained by

duodenal drainage were studied in normal persons and patients with cholecystitis. In the former urobilin is absorbed by the gall-bladder, in the latter urobilin is often produced by the gall-bladder. C. A. K.

Effect of sodium dehydrocholate (decholin) on bile salts, chloride, and cholesterol of bile in dogs. C. RIEGEL, I. S. RAYDIN, and M. PRUSHANKIN (Proc. Soc. Exp. Biol. Med., 1939, 41, 392—395).—Feeding 2—3 g. daily caused a large increase in bile-Cl', a variable but smaller increase in bile salts, and no change in cholesterol. V. J. W.

Assay [of secretin and cholecystokin] by contractions of frog's gall-bladder. L. D. SEAGER (Proc. Soc. Exp. Biol. Med., 1939, 41, 326—327).—Crude secretin preps. and Ivy's cholecystokin cause on intracardiac injection a contraction of the frog's gall-bladder which can be observed under the microscope. It has a latent period of 15—100 sec. V. J. W.

(xv) KIDNEY AND URINE.

Bovine kidney in health and disease. R. LANGHAM and E. T. HALLMAN (J. Amer. Vet. Med. Assoc., 1939, 95, 22—32).—The normal and pathological histology of the bovine kidney is described, the material dealing with pathological changes being derived from a group of cattle fed a diet low in Mg. Measurements were made of the renal tubules and their component parts. The renal lesions probably originate from medial degeneration of the interlobular arteries. This degeneration was vacuolar in character and an excess of lipins was not seen. Degeneration and atrophy of glomeruli and tubules occurred secondarily. Other changes occasionally seen included metaplasia of the epithelium of collecting tubules to the squamous type and calcification of the tubule epithelium. E. G. W.

Glomerular filtration rate after intravenous fluids. D. R. GILLIGAN, M. D. ALTSCHULE, and A. J. LINENTHAL (Arch. intern. Med., 1939, 64, 505—512).—Intravenous injection of physiological NaCl solution in normal subjects increased blood vol. and cardiac output, decreased plasma concn., and raised the venous pressure, but did not affect the glomerular filtration rate as measured relatively by the urea clearance test. C. A. K.

Effect of anoxæmia on kidney. L. BINET, M. V. STRUMZA, and A. SAMARAS (Compt. rend., 1939, 209, 576—578).—The effect on a dog under chloral anæsthesia of breathing an atm. containing 2.4 to 2.9% of O₂ is first to diminish the vol. of the kidneys, the output of urine, and the ureteric contractions. Apnoea follows, with a further decrease in kidney vol., ureteric paralysis, and anuria. If the anoxæmia is relieved, the kidney vol. returns to normal, and there is transient polyuria with albuminuria, and glycosuria. If the degree of anoxæmia is compatible with life the above phenomena do not appear constantly. The adrenals and vagi play no part in the phenomenon. J. L. D.

Experimental renal insufficiency. A. CHANTIN and S. LUDEWIG (Arch. intern. Med., 1939, 64, 513—525, 526—541).—(A) Various % of dried ex-

tracted livers were given to intact, unilaterally and partly nephrectomised rats. The first two groups were unaffected but the last showed hypertension, cardiac hypertrophy, and renal insufficiency of varying degrees, mostly on 20 to 40% liver diet.

(B) Dried extracted meat was fed to similar groups of rats. Partly nephrectomised animals showed hypertension and renal insufficiency. C. A. K.

Relation of methionine, cystine, and choline to renal lesions occurring on low-choline diets. W. H. GRIFFITH and N. J. WADE (Proc. Soc. Exp. Biol. Med., 1939, 41, 333—334).—Hæmorrhagic renal degeneration can be produced in rats on a 15% casein diet if choline and fat are sufficiently reduced, and is not produced on a fibrin diet if the fibrin is reduced from 15% to 5%. V. J. W.

Correlation between renal excretion and molecular structure of dyestuffs. R. HÖBER and P. M. BRISCOE (Proc. Soc. Exp. Biol. Med., 1939, 41, 624—626).—Frog's kidney was perfused with dye solutions through the renal portal vein. Various disulphonates were used. In general, when both sulphonic groups are on the same half of the mol. secretion occurs, but not when they are attached to different halves. V. J. W.

Calcium and oxalic acid metabolism in patients with renal calculi. J. C. GERRITS (Acta brev. neerl. Physiol., 1939, 9, 19—21).—Urinary oxalic acid excretion was increased (up to 162 mg. per day; normal excretion 15—55 mg.) in patients suffering from oxalate calculi; it is still increased some months after removal of the calculi. Oxalic acid excretion may be increased up to 203 mg. per day after ingestion of spinach. Patients with phosphate calculi showed no increased oxalate excretion. Administration of hippuric acid does not alter the excretion of Ca or of oxalic acid. A. S.

Reactions of urinary bladder of the cat under conditions of constant pressure. J. MELLANBY and C. L. G. PRATT (Proc. Roy. Soc., 1939, B, 127, 307—322).—The isotonic bladder of the cat shows continuous rhythmic contractions, the amplitude and frequency of which depend on the hydrostatic pressure. The rhythm is abolished by section of the nervi erigentes but not by section of the hypogastric nerve. Contraction may be produced by electrical stimulation of either set of nerves. The influence of adrenaline depends on dosages; small doses produce contraction, and moderate doses, relaxation followed by contraction, whilst large doses produce pure relaxation. Acetylcholine causes contraction followed by relaxation. F. B. P.

Reaction with sulphosalicylic acid in albuminuria. L. SCHALM (Acta brev. neerl. Physiol., 1939, 9, 4—5).—0.1 vol. of 20% sulphosalicylic acid is added to boiling urine containing albumin; on cooling the filtrate a ppt. appears which simulates Bence-Jones protein. On addition of saturated aq. NaCl, pptn. occurs only in Bence-Jones proteinuria. A. S.

Determination of nicotinic acid in urine. E. BANDIER (Biochem. J., 1939, 33, 1787—1793).—A technique is described for the determination of

nicotinic acid in urine by the CNBr-metol method (A., 1939, II, 196). Alkaline hydrolysis increases the colour reaction, owing to the presence in urine of a combined form of nicotinic acid, whilst acid hydrolysis liberates colour-producing substances other than nicotinic acid, the normal daily excretion of which is 1.5—5 mg. Most of the ingested nicotinic acid recovered from urine (14% in the first hr.) is excreted as nicotinic acid, which is hydrolysed by alkali. Preliminary treatment of urine with acetone followed by centrifuging is necessary to remove substances which mask the colour reaction, particularly when dealing with large amounts of nicotinic acid. Patients must not smoke immediately prior to a test, since nicotine (like coramine) gives a slight colour reaction. P. G. M.

Ring test for urine bromides. A. BLUMSTEIN, P. M. ZOLL, and J. J. MAYER (J. Lab. clin. Med., 1939, 25, 99—101).—1 c.c. of 20% trichloroacetic acid is mixed with 5 c.c. of urine and the mixture is overlaid with 0.5% AuCl₃. If Br is present in concn. over 50 mg.-% of urine a yellowish to a reddish-orange ring develops almost immediately at the interface. C. J. C. B.

Possibilities of control of lead exposure by examining less than 24-hour urine samples. E. C. BARNES (J. Ind. Hyg., 1939, 21, 464—468).—Analysis of a specimen representing 2—3 hr. excretion during the working day is shown to give a fairly reliable measure of the average excretion for the day, so long as specimens of extremely low sp. gr. are not used. The possible use of analysis of instantaneous samples of urine in the control of Pb exposure is discussed. J. W. S.

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

Physiology and pathology of the newborn. H. WILLI (Möchr. Geburtsh. Gynäk., 1939, 109, 207—242).—A survey of recent papers. (B.) A. S.

Variability of body temperature in the normal chick. W. F. LAMOREUX and F. B. HUTT (Poultry Sci., 1939, 18, 70—75).—The body temp. of chicks increased appreciably during the first week after hatching. From 7 to 10 days of age it differed with breed. No relation was apparent between body temp. and sex or body-wt. Sources of error in recording temp. are examined. A. G. P.

Insect size and temperature. W. H. GOLIGHTLY and L. LLOYD (Nature, 1939, 144, 155—156).—Increase of temp. results in diminished insect size in four species of nematoceros *Diptera*. W. F. F.

Regenerative power in the tailless amphibian limbs. L. V. POLESAEV and G. I. GINSBURG (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 733—737).—Autotransplantation of the leg of tadpoles does not stimulate regeneration in the early stages of leg development, but at a later stage regeneration is stimulated and, later still, inhibited. The region of transplantation affects regeneration. Histological changes are described. E. M. W.

Bilateral variation in weight and composition of long bones of experimental animals. C. E. WEAKLEY, jun., and R. B. DUSTMAN (J. Agric. Res., 1939, 58, 711—716).—In chicks the green wt. and % of water were higher and the % of ash and non-fatty org. matter were lower on the left than on the right side. In hog bones the green wt. and the % of water and non-fatty org. matter were higher and the % of ash was lower on the left side. In heifers the heavier bones were on the right side. Rat bones were similar on both sides. A. G. P.

Iron, copper, and manganese in human organs at various ages. G. BRÜCKMANN and S. G. ZONDEK (Biochem. J., 1939, 33, 1845—1857).—The life curve for total and non-hæmin Fe is even more distinct for the kidney than for the liver. The vals. are a max. (up to 3.2 and 2.9 g. per kg. of dry wt.) at birth and reach a min. at 2 years. A gradual rise then occurs up to 20 years, from which age vals. remain const. Severe anæmia may reduce Fe to the level at birth. Blood transfusion increases the level of non-hæmin Fe. Liver-Cu shows a max. at birth. The average val. for adults (34.6 mg. per kg. of dry wt.) may be increased in tuberculosis. Liver-Mn (7.0 mg. per kg. of dry wt.) is const. throughout life, whilst that of serum is 1—3 µg. per 100 c.c. P. G. M.

Chemical and spectrographic determination of iron in tooth material. M. M. MURRAY, G. E. GLOCK, and F. LOWATER (Brit. Dental J., 1939, 66, 345—350).—The Fe content of enamel (human) averaged 0.0279 and that of dentine 0.0087%. No significant differences in vals. for different classes of teeth were apparent. Hard, dark, subgingival calculus contained 0.0196 and white calculus 0.0089% of Fe. Administration of NaF lowered the Fe content of both enamel and dentine of upper incisors. The latter were always whiter than the lower incisors, which suffered no change in Fe content. A. G. P.

Electrodialysis of tissue-chloride. I. Method and controls. R. H. OSTER [with E. J. KEMP].
II. Kinetics of removal of chloride from tissues of the dog. R. H. OSTER and W. R. AMBERSON (J. Biol. Chem., 1939, 131, 13—18, 19—24).—I. A method for removing Cl⁻ from animal tissues prior to titration, based on the electrodialysis method of Joseph and Stadie (A., 1939, III, 14), is described. The method gives results for Cl⁻ which agree with those obtained by the wet ashing method. Electrodialysis of tissue requires 2—8 hr. depending on the type, amount, and condition of the tissue. Cl⁻ is removed at different rates from different tissues and in the case of connective tissue although 90% of the Cl⁻ is removed during the first 3 hr. electrodialysis must be continued for much longer periods to obtain the remaining 10%.

II. Cl⁻ is removed most rapidly from dog skeletal muscle, which agrees with the theory that the Cl⁻ is associated with the extracellular phase of this tissue. The rate of removal of Cl⁻ from brain, stomach, spleen, pancreas, and possibly lung is significantly lower than with skeletal muscle. Since Cl⁻ is removed only slowly from brain and approx. 5.5% of the total Cl⁻ remains after long periods of electrodialysis, it

is concluded that part of the brain-Cl' is intracellular. Ageing of tissues, including brain, increases the availability of Cl' for migration to the anode. Since some Cl' is retained by brain pulp after 24 hr. electro-dialysis and although this material and brain tissue after storing at 0° for 48 hr. and then at 100° for 1.5 hr. lose Cl' at rates equal to or exceeding that of skeletal muscle, it is suggested that part of the intracellular Cl' may be organically bound. J. N. A.

Variations in follicle population density in the Merino skin. H. B. CARTER (Nature, 1939, 143, 805—806).—Photomicrographs are used to study hair follicle population and size in Merino skin.

W. F. F.

Hemosiderin histiocytoma of skin. J. C. BERNSTEIN (Arch. Dermatol. Syphilol., 1939, 40, 390—396).—The lesion was produced by trauma. The patient had had this area injured repeatedly. The dead erythrocytes were phagocytosed by histiocytes, which became engorged and remained *in situ*, leading to the irregular growth of the tumour. (4 photomicrographs.) C. J. C. B.

Post-mortem pigmentary reaction in marine catfish *Plotosus anguillaris*. M. ENAMI (Proc. Imp. Acad. Tokyo, 1939, 15, 230—232).—Ligature of the ventral aorta was followed by gradual darkening of the body, attaining its max. within 1 hr., and then gradually fading. During this period transient blanching of alternate bands of skin caudal to the ligature, giving a striped pattern, was observed.

R. T.

Secretion of crystalloids and protein material by the pancreas in response to secretin administration. S. A. KOMAROV, G. O. LANGSTROTH, and D. R. McRAE (Canad. J. Res., 1939, 17, D, 113—123).—Changes in Na⁺, K⁺, Ca⁺⁺, Cl⁻, HCO₃['], and protein- and non-protein-N contents of pancreatic juice following continuous and intermittent administration of secretin are recorded. Simple inorganic ions pass readily through the membranes of the gland. The HCO₃['] and Cl['] concns. of the juice are inversely related. Some at least of the HCO₃['] is formed within the secretory cells. The absorbing protein of the secretion is either of a single type or consists of several types which are secreted in const. proportions whether enzymically active or not. A. G. P.

Synthesis and secretion of protein material by the pancreas. G. O. LANGSTROTH, D. R. McRAE, and S. A. KOMAROV (Canad. J. Res., 1939, 17, D, 137—149).—Data previously recorded (preceding abstract) are examined mathematically. Formulæ expressing the output of protein in pancreatic juice under the influence of secretin and under widely different conditions are given. The nature of various glandular mechanisms is discussed. A. G. P.

Proteins of herring flesh. S. WAKAMATSU (J. Agric. Chem. Soc. Japan, 1939, 15, 915—920).—The solubility of the muscle in mixed solvents, distribution of the proteins, the amino-acids in the flesh protein, the constituents of extracts of the flesh, and the nature of the purine bases in the flesh protein of herrings caught in the vicinity of Otaru in Hokkaido are determined. J. N. A.

E (A., III.)

Compounds between phosphatides and basic proteins. E. CHARGAFF and M. ZIFF (J. Biol. Chem., 1939, 131, 25—34).—Similarly to salmine (A., 1938, II, 516), thymus histone forms insol. compounds with kephalin between p_H 2 and 7, whilst with globin and kephalin appreciable formation of insol. compounds occurs only below p_H 4. Lecithin forms no compounds with globin and ppts. are obtained with thymus histone only between p_H 7 and 8. The composition of the complexes is not independent of the p_H at which they are formed, and the amount of kephalin entering into complex formation decreases with increasing p_H . The compounds differ from that between salmine and kephalin in being insol. in all org. solvents. The fact that thymus histone and salmine, both of which inhibit coagulation of blood, form ppts. with kephalin at a physiological p_H whilst globin, which has no anticoagulant action *in vivo*, does not form an insol. compound above p_H 4, supports the view that the anticoagulant action of protamines and histones is due to their reaction with the kephalin which constitutes part of the thromboplastic factor. Kephalin, but not lecithin, emulsified in water and treated with aq. solutions of methylene-blue and thionine forms deeply coloured insol. salts which are very resistant to cleavage into their components.

J. N. A.

Reaction between kephalin and hæmoglobins. E. CHARGAFF, M. ZIFF, and B. M. HOGG (J. Biol. Chem., 1939, 131, 35—44).—Addition of a neutral emulsion of kephalin in water to a solution of oxy-hæmoglobin showing sharp absorption bands at 575 and 540 $m\mu$. causes complete fading of the bands within 2—15 min. The resulting solution has no characteristic spectrum but addition of (NH₄)₂S produces a new spectrum with typical hæmochromogen bands around 560 and 530 $m\mu$. With lecithin there is no action except formation of reduced hæmoglobin. The "kephalin effect" is prevented or greatly retarded by addition of globin to the system, and appears to be due to disruption of the hæm-globin linkage. A similar effect is observed with CO-hæmoglobin and kephalin, but not lecithin. Reduced hæmoglobin is not attacked by kephalin. The hæmochromogens produced by the action of kephalin and (NH₄)₂S are in the reduced state. Plasmal (obtained from the mixed phosphatides of ox brain), hydrolysis products of kephalin, ethanalamine, and Na aminoethyl phosphate are without effect. Hæmoglobin, in contrast to CO- and oxy-hæmoglobin, is not attacked by kephalin. Solutions of CO-hæmoglobin containing kephalin yield ppts. when treated with acetic acid or veronal buffers. J. N. A.

Phenylalanine content of hen's egg-albumin. L. E. ARNOW, J. BURNS, and F. W. BERNHART (Proc. Soc. Exp. Biol. Med., 1939, 41, 499—500).—Determination of phenylalanine by a modified Kapeller-Adler method gave a content of 5.32% in egg-albumin and 4.73% in unhydrolysed egg-albumin. V. J. W.

Fatty acids and glycerides of body fat of she-goats. D. R. DHINGRA and M. HANEEF (J.S.C.I., 1939, 58, 292—293).—The fatty acids of the fat consist of lauric 2.5%, myristic 2.8%, palmitic 27.5%, stearic 26.0%, arachidic 2.2%, oleic 34.8%, and

linoleic acid 2.3%. The component glycerides have been determined (cf. B., 1939, 70).

Constituents of ambergris. I. T. ISHIGURO and M. WATANABE (J. Pharm. Soc. Japan, 1938, 58, 260—262).—The ether-sol. part (87.7%) of ambergris (from the sperm-whale) contains arachidic and other acids (some unsaturated) and epicoprosterol esters. The aromatic and odorous substances may be unsaturated or carbonyl compounds. R. S. C.

Mineral composition of hæmolymp of silkworms. K. BIALASZEWICZ and C. LANDAU (Acta Biol. Exp. [Warsaw], 1939, 12, 307—320).—The Mg content of the hæmolymp diminishes before metamorphosis of the silkworms. The Na and Cl content increases and K and Mg remain const. during metamorphosis. A. S.

Excretion of emerging butterfly. J. HELLER (Acta Biol. Exp. [Warsaw], 1939, 12, 262—264).—The excretion produced during the emergence of a butterfly from its chrysalis has p_{H} 5.8—6.1 and contains in males 15.5 mg. and in females 12.1 mg. of N in the form of uric acid, 6 mg. of K, and 0.4—1.4 mg. of P. A. S.

(A) Compounds of phosphorus in milk. (B) Phosphorus, calcium, and magnesium in milk. B. N. ACHARYA and S. C. DEVADATTA (Proc. Indian Acad. Sci., 1939, 10, B, 221—228, 229—235).—

(A) Five types of acid-sol. P compounds have been characterised in buffalo milk; these are non-hydrolysable and hydrolysable P sol. in aq. Ba(OH)₂, and ortho-, pyro-, and non-hydrolysable P insol. at p_{H} 9. Casein- and lipin-P have also been determined. Average vals. are given.

(B) The acid-insol. portion of milk is mainly casein which has adsorbed some Ca⁺⁺ and Mg⁺⁺. The acid-sol. portion consists of Ca₃ and Mg₃ phosphates and org. P. The water-sol. portion consists of acid Ca and Mg phosphates. The scum formed on heating milk is derived from both the acid-sol. and acid-insol. portions. Dialysis produces a water-sol. fraction from the acid-insol. portion. Vals. are given for the P, Ca, and Mg of these fractions. P. G. M.

(xvii) TUMOURS.

Benzpyrene tumour strain in hamsters with tendency to metastasis formation. L. HALBERSTAEDTER (Nature, 1939, 144, 377—378).—Metastases were found in hamsters (*Cricetus aureus*) in lymph glands following subcutaneous injections of benzpyrene. W. F. F.

Effects of 3:4-benzpyrene on human skin. G. B. COTTINI and G. B. MAZZONE (Amer. J. Cancer, 1939, 37, 186—195).—Daily applications on the skin of a 1% benzene solution of benzpyrene in 26 human subjects for periods not exceeding 4 months resulted in local reactions. Erythema, pigmentation, desquamation, formation of verrucae, and infiltration developed successively. On stopping treatment after a max. of 120 doses complete regression occurred within 2—3 months. The reactions were more pronounced in older than in younger individuals, and on unprotected skin surfaces. The assumption appears

warranted that benzpyrene would be carcinogenic if applied to human skin for long periods. F. L. W.

Increase in rate of growth of paramecium subjected to the blastogenic hydrocarbon 3:4-benzpyrene. J. C. MOTTRAM (Nature, 1939, 144, 154).—Benzpyrene applied to animal tissues induces a localised hyperplasia through direct action on the cells. W. F. F.

Effect of petroleum ether extract of mouse carcasses as solvent in production of sarcoma. J. J. MORTON and G. B. MIDER (Proc. Soc. Exp. Biol. Med., 1939, 41, 357—360).—3:4-Benzpyrene dissolved in this extract caused tumour formation in 2% of experiments, dissolved in sesamé oil in 78%, and in colloidal solution in 50%. V. J. W.

Nitrogen-containing carcinogenic substances. L. JOSEPH (Proc. Soc. Exp. Biol. Med., 1939, 41, 334—336).—2:9(N)-Indoloanthrone and a no. of heterocyclic compounds including 1:2(N)-pyridoanthracene and 3(N):4-pyridophenanthrene were not found to be carcinogenic in mice. V. J. W.

Wheat-germ oil and tumour formation. E. DINGEMANSE and W. F. VAN ECK (Proc. Soc. Exp. Biol. Med., 1939, 41, 622—624).—No abdominal tumours were found in rats which received 3—4 c.c. daily of ether extract of wheat-germ oil for 267 days. V. J. W.

Failure of wheat-germ oil extracts to produce abdominal neoplasms in rats. H. M. EVANS and G. A. EMERSON (Proc. Soc. Exp. Biol. Med., 1939, 41, 318—320).—No neoplasms were produced by feeding large doses of expressed oil, or of light petroleum or ether extracts. V. J. W.

Serological specificity of experimental tumours. Serological specificity of benzpyrene tumours of rats. L. DMOCHOWSKI (Amer. J. Cancer, 1939, 37, 252—264).—The serological properties of tumours produced in Wistar rats by injection of benzpyrene were investigated. By means of intravenous inoculations of rabbits and Wistar rats immune sera were obtained which gave a positive complement-fixation with heated saline extracts of tumours and, to a lower degree, with extracts of normal rat tissues and organs. Immune sera against normal rat muscle contain antibodies which fix complement with rat tumour and rat embryo extracts more strongly than with homologous antigen. Differences in the extracts of normal and tumour tissue are discussed in relation to serological properties of a dying tissue. F. L. W.

Action of dimethylaminoazobenzene on tissues. S. MORIGAMI (Gann, 1939, 33, 281—285).—Addition of dimethylaminoazobenzene to cultures of normal fibroblasts produced changes resembling malignancy, but the cells would not produce tumours when grafted into fowls. E. B.

$\Delta^{3:5}$ -Cholestadiene from cholesteryl oleate and its possible bearing on formation of carcinogenic substances in heated fats. H. VELDSTRA (Nature, 1939, 144, 246—247). W. F. F.

Presence of cancer-producing substances in roasted food. E. M. P. WIDMARK (Nature,

1939, 143, 984).—Alcoholic or light petroleum extracts of roasted food are carcinogenic when painted on mouse skin. The findings are based on a statistical survey of the results. W. F. F.

Skin cancer due to handling coal tars used for preservation of fishing nets. J. M. TWORT and R. LYTH (*Nature*, 1939, 144, 446).—Tar manufactured in a horizontal retort at 1100° was highly carcinogenic. Creosote oil and anthracene oil were also carcinogenic for mice. W. F. F.

Is or is not cancer dependent on age? F. BERNSTEIN, Z. W. BIRNBAUM, and S. ACHS (*Amer. J. Cancer*, 1939, 37, 298—309).—The studies of Bullock, Curtis, and Dunning (cf. following abstract) on *Cysticercus* sarcoma in rats, produced by infestation with the eggs of the parasite, are subjected to a critical statistical analysis. The conclusion is reached that, contrary to the view of these authors, the average time for tumour production depends on the age of the rat at infestation. F. L. W.

Malignancy induced by *Cysticercus fasciolaris*: its independence of age of host when infested. W. F. DUNNING and M. R. CURTIS (*Amer. J. Cancer*, 1939, 37, 312—328).—In view of the criticisms of Bernstein *et al.* (cf. preceding abstract) a re-examination of data in previous publications is made. The conclusion that the initial age of the rat is not an important factor in the production of tumours is maintained. F. L. W.

Production of gastric tumours, bordering on malignancy, in Javanese monkeys through agency of *Nochti nochti*, a parasitic nematode. C. BONNE and J. H. SANDGROUND (*Amer. J. Cancer*, 1939, 37, 173—185).—*N. nochti*, a trichostrongylid nematode parasite, causes tumour formation in the stomach of the common Javanese monkey (*Macacus mordax*). The worms live in the depth of the tumour and are never found free on the surface of the gastric mucosa. There is a const. association of the tumour and worm. The tumours are sharply localised adenopapillomatous growths invading the submucosa. In one case endothelial proliferation and thrombosis of a submucosal vein with incipient epithelial invasion of the vessel wall were produced. In 2 monkeys, originally free from tumour and worms, tumours developed in 2—3 months after the introduction of worms to the stomach. A description is given of *N. nochti* and its larval development. F. L. W.

Acanthosis nigricans and cancer of liver in dog. H. O. CURTH and C. A. SLANETZ (*Amer. J. Cancer*, 1939, 37, 216—223).—A case of acanthosis nigricans and carcinoma of the liver in a dog is described. This is another instance of the association of acanthosis nigricans and a glandular cancer and supports Curth's hypothesis that there is a common genetic factor for acanthosis nigricans and the cancer. F. L. W.

Transmission experiments with fibroma (Shope) and myxoma (Sanarelli) viruses. R. R. HYDE and R. E. GARDNER (*Amer. J. Hyg.*, 1939, 30, B, 57—63).—The fibroma virus is not spread by contact whereas the myxoma virus spreads readily by contact. Very little acquired immunity to the fibroma and

myxoma viruses is transmitted to the offspring either directly or through the mother's milk, neither is the fibroma virus transferred in this way. The placenta acts as a carrier to both viruses. B. C. H.

Infectious myxomatosis of rabbits (Sanarelli) versus fibroma virus (Shope) with reference to time interval in establishment of concomitant immunity. R. R. HYDE (*Amer. J. Hyg.*, 1939, 30, B, 47—55).—Experimental myxomatosis of rabbits is greatly reduced if preceded by intradermal injections of fibroma virus. When the fibroma virus is given 48 hr. before the myxoma virus the response to the latter is reduced and the animal usually survives; an interval of 96 hr. limits the lesion to the site of injection and there are very slight constitutional symptoms. The time interval between injections and the amount of myxoma virus injected determine the degree of immunity as shown by nodular formation. The immunity is of a cellular nature although complement-fixation antibodies are present. B. C. H.

Immunological experiments with highly concentrated suspensions of the Rous I tumour-producing agent. C. R. AMIES and J. G. CARR (*J. Path. Bact.*, 1939, 49, 497—513).—Highly active conc. suspensions of the filterable fowl tumour agents are prepared by sedimenting the agent from cell-free tumour extracts by centrifuging at p_H 5—5.5 and digesting the resuspended deposit with commercial trypsin at p_H 9.0; the agent is recovered by further fractional centrifuging. The inhibition of the Rous I and des Ligneris sarcoma agents by rabbit anti-fowl serum appears to depend on a sp. antigen-antibody reaction. The sera of rabbits which have been repeatedly inoculated with large doses of tumour agent suspension contain neutralising antibodies for the agent and also anti-fowl haemolysins and precipitins. The latter are present only in relatively low concn. and may have been produced in response to impurities (cell debris) present in the suspensions used for inoculation. Absorption of rabbit anti-fowl or rabbit anti-tumour agent serum with normal chick embryo tissue completely removes its inhibitory properties for the tumour agent. Fowl anti-agent serum, on the contrary, is not affected by absorption with chick embryo. Iso-antibodies play no part in the inhibition of the tumour agent by Rous-immune fowl serum. These experiments suggest that the tumour agent has at least 2 antigenic components, corresponding with 2 antibodies, one of which is present in Rous-immune fowl serum and the other in rabbit anti-fowl serum. C. J. C. B.

Chemical composition of active agent of Rous sarcoma no. 1 and related products. A. POLLARD (*Brit. J. exp. Path.*, 1939, 20, 429—438).—Preps. of Rous sarcoma no. 1 purified by fractional centrifuging and tryptic digestion contained an inactive lipid fraction and an active protein fraction containing both P and carbohydrate, probably as nucleic acid. Products derived by centrifuging from non-filterable fowl tumours were similar in general composition to the Rous agent although they possessed no infectivity. The Rous agent is probably more complex than bacteriophage, which consists almost entirely of nucleoprotein. W. F. R. SE.

Physico-chemical properties of Rous chicken tumour agent. K. G. STERN and F. DURAN-REYNALS (Science, 1939, 89, 609).—Ultra-centrifuge data give the size of the tumour-producing material as of mean diameter 70 μ . W. F. F.

Nature of agent causing leucosis in fowls. K. G. STERN and A. KIRSCHBAUM (Science, 1939, 89, 610—611).—In chemical and physical properties the material resembles the Rous chicken tumour agent (see preceding abstract). W. F. F.

Desiccation of filterable tumours and other biological materials. R. KNOX (J. Path. Bact., 1939, 49, 467—481).—The apparatus described satisfies the conditions necessary for an efficient high-vac. system. It is small and compact, low pressures are reached with great speed, and the temp. at the evaporating surface falls quickly to well below the f.p. and can be maintained at that level without the aid of external refrigeration. With immune sera and complement, desiccates show no loss of titre when compared with fresh material. With the filterable fowl tumours, highly active desiccates have been obtained. Even in high dilution these produce tumours in approx. the same time as do fresh tumour extracts of equiv. strength. The dried product is easily powdered and when cell debris has been removed by light centrifuging gives a uniform suspension suitable for experimental work. Filtration of dried material through a Berkefeld *N* candle has been successful and Berkefeld *N* filtrates of fresh material have been successfully dried, though with some loss of activity. C. J. C. B.

Bile production in tumour-bearing mice and use of bile in filtration. L. D. PARSONS (Nature, 1939, 144, 75—76).—The growth of the Mal. sarcoma in mice caused increased bile secretion. Addition of bile to tumour extracts facilitated filtration and previous injection of bile increased the incidence of tumours when filtrates were injected into mice. E. B.

Histology of the transplanted breast cancer of mice. A. KORÉNYI (Magyar Orv. Arch., 1939, 40, 215—220).—The essential histological changes in successive transplantations are due to the increased adaptability of the cancer cells. A. W. M.

Transplantation of Ehrlich's cancer in young and old mice. A. KORÉNYI (Magyar Orv. Arch., 1939, 40, 221—223).—Tumour development is greater in young than in old mice. Apart from the tumour growth, most animals increased in body-wt., which shows that the presence of the tumour does not cause cachexia. A. W. M.

Comparison of chemical composition between hepatoma and normal liver tissues. VIII. Lipins. S. KISHI, T. FUJIWARA, and W. NAKAHARA (Gann, 1939, 33, 333—340).—The "cholesterol" fraction from hepatoma tissue differs from that of normal liver in containing $\frac{1}{5}$ ergosterol or 7-dehydrocholesterol, as judged from the absorption spectra. The I val. of phosphatide was about $\frac{1}{2}$ that of normal liver. E. B.

Glutamic acid of tumour proteins. A. C. CHIBNALL, M. W. REES, G. R. TRISTRAM, E. F.

WILLIAMS, and E. BOYLAND (Nature, 1939, 144, 71—72).—Glutamic acid isolated as Ca salt from tumour-protein hydrolysates had the normal configuration (cf. Kögl and Erxleben, A., 1939, III, 489). E. B.

Influence of ultra-short waves on the growth of rabbit sarcoma. VII. Influence of local irradiation on the whole individual. N. NOBUOKA (Gann, 1939, 33, 294—314).—Exposure of rabbits bearing the Kato sarcoma to ultra-short waves produces (1) immediate reduction in leucocyte and lymphocyte counts and increased pseudoeosinophils; (2) a slight increase in serum-Ca and decrease in serum-K; (3) increased basal metabolism. The optimal λ is 4.5 m. E. B.

Temperature factors in cancer and embryonal cell growth. L. W. SMITH and T. FAY (J. Amer. Med. Assoc., 1939, 113, 653—660).—Temp. below 90° F. cause degeneration of carcinomatous tissues and arrest development in the chick embryo. Parts of the human body which normally have relatively low temp. (e.g., the skin of the extremities at 88—90° F.) rarely develop carcinoma. Treatment of cases of malignant disease by "refrigeration" produces relief of pain and degeneration of the growth.

C. A. K.

Malignant tumours in childhood. H. W. DARGEON. **Malignant tumours of bone in children.** B. L. COLEY and R. L. PETERSON. **Lymphomas, leukæmias, and allied disorders in children.** L. F. CRAVER. **Cancers of the genitourinary organs in children.** A. L. DEAN. **Gynaecologic cancer in children.** J. A. KELLY. **Cancer of the head and neck in children.** H. E. MARTIN. **Tumours of the soft somatic tissues in infancy and childhood.** G. T. PACK and T. J. ANGLEM. **Blood and lymph vessel tumours in children.** W. L. WATSON (J. Pediat., 1939, 15, 317—326, 327—331, 332—339, 340—353, 354—362, 363—371, 372—400, 401—407). C. J. C. B.

Abortifacient action of serum and urine from patients with cancer. K. W. THOMPSON, T. HALE, and B. B. WHITCOMB (Amer. J. Cancer, 1939, 37, 233—241).—The experiments of Elsasser and Wallace (cf. A., 1939, III, 700) were repeated in part. The urine or serum of the majority of the tested cancer subjects contained a principle which caused the termination of early pregnancy in rabbits. The principle was not sp. for cancer since 3 of 6 apparently non-cancerous patients had this agent in the blood or urine and one cancer patient did not have it. The principal lesions were in the uteri of the injected animals. F. L. W.

Growth of induced plant tumours. L. J. HAVAS (Nature, 1939, 143, 789—791).—A review. W. F. F.

(xviii) NUTRITION AND VITAMINS.

Nutrition of the domesticated rabbit. Course of ingestion. Efficiency of nutrition. A. GARNIER (Bull. Soc. Sci. Hyg. Aliment., 1939, 27, 85—109).—The course of ingestion of food by rabbits having access to the ration throughout 24 hr. is discontinuous and varies from day to day in individuals

and still more between different animals. In general more food is eaten by night than by day. The average ingestion, absorption, and utilisation of water, dry matter, and energy vary by 30—75% between individuals of the same race and similar wt. when kept at 0—3°. The importance of acclimatising rabbits before undertaking calorimeter trials is demonstrated. A. G. P.

(A) Retarded growth, life span, ultimate body size, and age changes in the albino rat after feeding diets restricted in calories. C. M. MCCAY, L. A. MAYNARD, G. SPERLING, and L. L. BARNES. (B) Chemical and pathological changes in ageing and after retarded growth. C. M. MCCAY, G. H. ELLIS, L. L. BARNES, C. A. H. SMITH, and G. SPERLING (*J. Nutrition*, 1939, 18, 1—13, 15—25).—(A) Growth of rats may be retarded for long periods (100 days) by feeding diets complete except for calories. Retarded animals subsequently receiving adequate diets never attain the same sizes as those maturing normally. After retardation for 100 days not all rats could resume growth on a normal diet. Maintenance of const. body-wt. in retarded rats is associated with restriction but not cessation of bone growth. Bones responded to additional feeding after 700 days' but not after 1000 days' retardation.

(B) Deposition of Ca in eyes of retarded rats was unrelated to that in other tissues and increased with old age irrespective of retardation. Retarded rats showed rather more destruction of teeth, less marked calcification of costal cartilages, greater calcification of the aorta, and less tendency to lung disease at 1 year and to tumour formation than did normal animals.

A. G. P.

Influence of acidic and basic diets on the animal organism. IV. Relation between effect of basic and acidic diets and season. L. I. GREBENNIK (*Ukrain. Biochem. J.*, 1939, 13, 359—372).—Groups of rabbits were maintained on neutral, basic, and acidic diets for over a year, under const. conditions of temp. and illumination. During this period no significant differences in the wt. or the N and P metabolism of the three groups were observed.

R. T.

Production of goitre in rats with raw and with treated soya-bean flour. G. R. SHARPLESS, J. PEARSONS, and G. S. PRATO (*J. Nutrition*, 1939, 17, 545—555).—A ration of soya-bean flour-yeast-sugar-butter fat-NaCl-CaCO₃ produced thyroid enlargement of 4 times normal in 7 weeks. The min. I requirement of rats receiving the goitrogenic diet was twice normal. Unprocessed soya-bean flour contains a goitrogenic principle which is not eliminated by fat solvents or by steaming.

A. G. P.

Iodine survey of New Zealand livestock. V. Sheep of the North Island. D. F. WATERS (*Trans. Roy. Soc. New Zealand*, 1939, 69, 49—55; cf. A., 1938, III, 655).—The I content of 464 lamb thyroids from various areas shows that the North Island is generally well supplied with I. The only area low in I is the Manawatu-Wanganui plain where, however, no enlarged glands have been found to occur.

J. N. A.

Nutritive value of freshly ground and of stored rye whole flour as deduced from effect on liver-glycogen. A. BICKEL (*Biochem. Z.*, 1939, 302, 198—210).—When rats are maintained on a diet in which the protein source is freshly ground, whole rye, the glycogen content of their livers is 32—85% greater than that of rats on diets having the same calorie, vitamin, and protein content but containing whole rye flour stored for periods up to 9 months, with caseinogen or egg-protein + wheat-protein as protein source. W. McC.

Influence of diet on intoxication with phenol and cyanide. A. R. MEYER (*Proc. Soc. Exp. Biol. Med.*, 1939, 41, 402—404).—Rats on a diet containing 18% of protein were more resistant to phenol poisoning than on one containing 5%. Resistance to CN' was increased in rats receiving a diet rich in lard. V. J. W.

Influence of diet on resistance to diphtherial toxin. A. R. MEYER (*Proc. Soc. Exp. Biol. Med.*, 1939, 41, 404—406).—Mortality to toxin was reduced 50% in rats on the high-protein diet. V. J. W.

Milk and nutrition. IV. Effects of dietary supplements of pasteurised and raw milk on growth and health of school children (final report). MILK NUTRITION COMMITTEE (*Nat. Inst. Res. Dairying*, 1939, 4—68; cf. A., 1938, III, 502; B., 1938, 1221).—(A) Addition to the diet of $\frac{1}{2}$ pint of pasteurised or $\frac{2}{3}$ of raw or pasteurised milk resulted in greater increases in wt., height, and chest circumference than in the control (biscuit) group. This effect was independent of sex or age, and was more marked with the larger quantity of milk. No significant difference could be detected between raw and pasteurised milk by any of the tests. Similar results were obtained by assessing muscular strength and "nutritional" and "intellectual" categories for the children. Attempts to assess complexion, expression, posture, tonsils, eyes, and teeth were inconclusive.

(B) Summary of results of all researches initiated by the Milk Nutrition Committee.

(C) Daily consumption of milk ($\frac{1}{2}$ or $\frac{2}{3}$ pint, raw or pasteurised) improved physique, general appearance, and scholastic ability. Improvement in muscular strength is less marked. Calf feeding experiments failed to detect significant differences between raw and pasteurised milk. The only detectable effects of pasteurisation by laboratory experiments were 20% loss in vitamin-C and a slight loss in -B₁. The total nutritive val., availability and nutritive value of protein, Ca, and P, and -A and -D are unaffected. From a practical point of view pasteurised milk is as good as raw. J. G. D.

Nutritional requirements of dogs. A. ARNOLD and C. A. ELVEHJEM (*J. Amer. Vet. Med. Assoc.*, 1939, 95, 187—194).—A table is given showing the food maintenance requirements of adult dogs in terms of an American canned dog food which had been previously shown to be a complete diet. In feeding experiments it was shown that, when the Ca/P ratio is favourable (1:1.2), the vitamin-D requirements of dogs are similar to those reported for other rapidly growing species, e.g., chicks. The requirements of

dogs for thiamin, riboflavin, and nicotinic acid are discussed. E. G. W.

Is running fits a deficiency disease? A. ARNOLD and C. A. ELVEHJEM (J. Amer. Vet. Med. Assoc., 1939, 95, 303—308).—Hysteria was successfully produced in five dogs by a diet consisting solely of wheat and meat scraps subjected to dry heat in a retort kept at 200°. Symptoms of hysteria developed in 3—16 days after giving the special diet. Addition of 10% of crude casein to the diet was effective in preventing the fits; the effect of casein is probably due to its lysine content. E. G. W.

Dynamic effects and net energy values of protein, carbohydrate, and fat. E. B. FORBES, J. W. BRATZLER, E. J. THACKER, and L. F. MARCY (J. Nutrition, 1939, 18, 57—70).—The individual dynamic effects on rats of beef protein, dextrin, and lard decreased in the order named, but that of a mixture of these nutrients was much lower than that calc. from the individual vals. The net energy vals. of the nutrients were in the order beef protein < dextrin < lard. The low val. for the protein is ascribed to its low metabolisability and high heat increment. Dynamic effects were greater for 100-g. than for 240-g. rats. A. G. P.

(A) **Growth, activity, and composition of rats fed diets balanced and unbalanced with respect to protein.** (B) **Heat increments of diets balanced and unbalanced with respect to protein.** T. S. HAMILTON (J. Nutrition, 1939, 17, 565—582, 583—599).—(A) Increase in the % of whole egg protein in rat diets (by substitution for starch) from 4 to 54 caused a slow increase in metabolisable energy, but did not affect the % of gross energy which was metabolisable until the protein level reached 30%, when a decrease occurred. The digestibility of food-energy and -N was not consistently affected but there was a gradual decline in urinary energy/N ratio. The growth-promoting val. of the diet increased with the protein content from 4 to 16%, remained stationary with 16—30%, and decreased with more than 30% of protein. The appetite of the rats was adversely affected by rations containing less than 16 or more than 22% of protein. Voluntary activity was unaffected by the protein content of the ration unless excess was present. The proportion of fat and protein in the live-wt. gains was const. with 16—42% of protein in the diet; with less than 16% of protein relatively more fat and with 54% of protein relatively less fat was produced. The wt. of livers and kidneys increased directly with the protein content of the diet.

(B) Progressive substitution of the starch in rat diets by dried, extracted whole egg resulted in decrease in heat increment (sp. dynamic effect) with rise in protein to 18%, const. val. in the range 18—30%, with a further increase when the protein exceeded 42% of the diet. The net energy val. (for maintenance + growth) increased with the protein content of the diet up to 16%, was const. in the range 16—30%, and decreased rapidly when the protein exceeded 30%. Growth-promoting ability of the diet is inversely related to the heat increment. The diets are equally well balanced when the protein

level is 16—30%. The % of the metabolisable energy used for basal expenditure or total voluntary activity is unaffected by the % protein in the diet and is independent of the total amount of food consumed. A. G. P.

Effect of level of protein intake on growth and feed utilisation of turkeys. J. C. HAMMOND and S. J. MARSDEN (J. Nutrition, 1939, 18, 11—18).—In turkeys receiving *ad lib.* mash and grain rations, the protein, Ca, or P contents of the ration had no consistent influence on mortality, malformation of leg or breast bones, or the amount of feed required for unit gain in wt. The amount of total and animal protein consumed per unit gain in wt. increased as the protein content of the ration was raised from 18 to 26%, but remained stationary at higher levels. The efficiency of food utilisation was a linear function of the live wt. Satisfactory growth was made on rations containing 18—30% of protein provided at least 7.5% of the protein was of animal origin. The proportion of grain to mash consumed increased with the protein content of the mash. A. G. P.

Utilisation of energy-producing nutriment and protein as affected by the level of intake of beef-muscle protein. E. B. FORBES, A. BLACK, E. J. THACKER, and R. W. SWIFT (J. Nutrition, 1939, 18, 47—56).—The metabolisability of rat diets diminished fairly uniformly as the dietary protein was increased from 10 to 45%. Heat production also diminished with increase in dietary protein at rates which were less than those of the accompanying decrease in metabolisable energy at lower levels of food intake but greater than those at high intake levels. Increase in body-wt. tended to decline with progressive increase of dietary protein at low levels of food intake and to increase at high levels of intake. Effects of the composition of the diet on the distribution of food-N and on the proportion of fat and protein stored are discussed. Beef-muscle protein has no greater heat-stimulating effect than has casein for growing rats. A. G. P.

Glycine toxicity [to hens]. A. R. PATTON (Poultry Sci., 1939, 18, 31—34).—Glycine fed at the rate of 4 g. or over per day was toxic to hens. Symptoms of prostration and coma were accompanied by a large increase in urinary N, a diminution of liquid excretion, and kidney damage. Glycine toxicity was not due to oxalic acid, methylamine, acidosis, alkalosis, or increase in blood-glycine but directly to excessive intake of amino-acid. *dl*-Alanine was somewhat toxic but urea and glucose had no ill effects. A. G. P.

Effect of choline on ability of homocystine to replace methionine in the diet. V. DU VIGNEAUD, J. P. CHANDLER, A. W. MOYER, and D. M. KEPPEL (J. Biol. Chem., 1939, 131, 57—76).—Growth of rats on a diet containing homocystine in place of methionine is not maintained unless choline is added to the diet. Suboptimal growth can be maintained on the homocystine diet if tikitiki or milk vitamin concentrate is present. The effect of these is due to the presence of choline, and 1 and 2% of choline has been isolated from each respectively. Growth with homo-

cystine and choline is better at a level of 1.25 than at 0.625% of homocystine. Betaine chloride has a similar effect to choline, but sarcosine, β -alanine, ephedrine, caffeine, triethylhydroxyethylammonium chloride, methyl alcohol, ethanolamine, mono- and trimethylamine, ethyl- β -methylcholine, ergothioneine, and creatinine are inactive. It is suggested that choline makes possible the *in vivo* methylation of homocysteine to methionine and the significance of the results in the metabolic inter-relationship of methionine and choline is discussed. J. N. A.

Availability for growth of *N*-methyltryptophan administered as its acetyl derivative. W. G. GORDON, W. M. CAHILL, and R. W. JACKSON (J. Biol. Chem., 1939, 131, 189—196).—Whereas both *l*-*N*-methyltryptophan and acetyl-*l*-tryptophan promote growth, acetyl-*l*-*N*-methyltryptophan is not utilised by rats on a tryptophan-deficient diet. H. G. R.

Utilisation of the calcium in various greens. M. SPEIRS (J. Nutrition, 1939, 17, 557—564).—The availability to rats of the Ca of turnip greens almost equalled that of milk; that of tendergreen, collards, and kale was slightly lower. The Ca of New Zealand spinach was scarcely utilised at all and tended to lower the availability of milk-Ca. A. G. P.

Caries and sugar: crude and refined sugars compared in respect of calcium and phosphate content. M. M. MURRAY (Brit. Dental J., 1939, 66, 144—146).—The low Ca and P content of crude sugar juice and less refined sugars is insufficient to explain the difference in incidence of caries between communities eating refined and those eating crude sugar or chewing sugar-cane. A. G. P.

Factors affecting manganese utilisation in the chicken. H. S. WILGUS, jun. and A. R. PATTON (J. Nutrition, 1939, 18, 35—45).—Increased severity of perosis resulting from the feeding of steamed bone flour is due to removal of Mn from solution in the digestive tract by $\text{Ca}_3(\text{PO}_4)_2$. Similar effects following administration of Fe^{III} citrate are associated with removal of Mn by the $\text{Fe}(\text{OH})_3$ formed. Supplementary feeding of PO_4^{3-} does not aggravate perosis unless a sufficient excess of Ca is present to cause pptn. as $\text{Ca}_3(\text{PO}_4)_2$. A. G. P.

(A) Amount of manganese required to prevent perosis in the chick. (B) Effect of a deficiency of manganese in the diet of the hen. W. D. GALLUP and L. C. NORRIS (Poultry Sci., 1939, 18, 76—82, 83—88).—(A) The min. Mn requirement to lower the incidence of perosis to 4% was approx. 50 p.p.m. of the ration; vals. differed with breed and strain and very large proportions (up to 1000 p.p.m.) did not eliminate perosis developing in very young chicks. Such perosis probably originates during embryonic development of the chick. No toxicity was apparent even at high levels of administration (1000 p.p.m.).

(B) The Mn content of egg yolks increased proportionally with that of the hen's ration (13—1000 p.p.m.). A Mn-deficient diet caused low egg production and high mortality in the embryo. The min. Mn requirement of the embryo was approx. 0.005 mg. *i.e.*, 70% of the total Mn of the egg. Chicks hatched

from eggs of low Mn content were no more susceptible to perosis than those from high-Mn eggs. Prevention of perosis during early growth depended more on Mn intake than on Mn reserves at hatching. A. G. P.

Assimilation and storage of manganese in the developing embryo and growing chick. W. D. GALLUP and L. C. NORRIS (Poultry Sci., 1939, 18, 99—105).—The Mn content of the developing chick embryo reaches max. (0.613 mg. per 100 g. dry wt.) at the 9th day of incubation and subsequently declines. 75% of the Mn of the yolk is assimilated by the embryo during incubation. Assimilation of Mn by chicks receiving Mn-deficient and Mn-supplemented rations is recorded. In Mn deficiency the requirements of the liver are first met even if this involves depletion of Mn from bones. The total Mn in chicks increases during the first 5 days but remains stationary until the 24th day. This period of low retention coincides with the period of high susceptibility to perosis. Depletion of liver-Mn even with low-Mn rations did not begin until the chicks were more than 6 weeks old. Subsequently the level of liver-Mn was roughly proportional to the Mn content of the ration. A. G. P.

Cobalt deficiency at Glenhope, Nelson, New Zealand. H. O. ASKEW (New Zealand J. Sci. Tech., 1939, 20, 302—309A).—Administration of acid extracts of a healthy soil or of aq. CoCl_2 maintained sheep in good condition for 2 years on a "bush-sick" pasture. Neither Fe nor Cu was a factor in the curative process. The treatment did not induce appreciable changes in red cell or haemoglobin content or in corpuscular vol. of the blood. A. G. P.

Effect of apple constituents on retention by growing rats of lead contained in spray residues. J. B. SHIELDS, H. H. MITCHELL, and W. A. RUTH (J. Nutrition, 1939, 18, 87—97).—The assimilability by rats of Pb from the original PbHAsO_4 of the spray is similar to that from the final residue on apples. Apples contain a substance (? pectin) which depresses retention of Pb probably by restricting absorption in the intestinal tract. When the amount of Pb residue is small the relative restriction of absorption may be appreciable. A. G. P.

Vitamins. COUNCIL ON PHARMACY AND CHEMISTRY and COUNCIL ON FOODS (J. Amer. Med. Assoc., 1939, 113, 589—595).—A review of the status of vitamins. C. A. K.

Cultivation of *Phaseolus calcaratus*, Roxb.; some feeding experiments. N. C. NAG and A. K. PAIN (Trans. Bose Res. Inst., 1936—7, 12, 59—64).—Analytical data are recorded. Rats deficient in fat-sol. vitamins improved after feeding the seed. A. G. P.

Vitamin-A and carotenoids in liver of mammals, birds, reptiles, and man, with regard to intensity of ultra-violet absorption and Carr-Price reaction of vitamin-A. H. B. JENSEN and T. K. WITH (Biochem. J., 1939, 33, 1771—1786).—The vitamin-A and carotenoids in the livers of 33 mammals, 41 birds, 4 reptiles, and 8 men have been determined. $-A_2$ is absent in all cases. Some variation occurs between individuals of the same

species and, to a greater extent, between different species. Rodents have only small amounts of -A in the liver, whilst a whale (*Grampus*) had almost none. No appreciable amounts of -A are consumed during the hibernation of reptiles, and amounts in the livers of many animals are but little affected by starvation. The livers of domesticated animals contain less than those of similar wild animals. Pig liver has a low val. (100 i.u. per g.), attributable to the nature of the usual food. The highest vals. are obtained in the livers of wild birds (up to 6000 i.u. per g.). The irregularity of the -A content of livers applies also to carotenoids, although the storage of the latter is not proportional to the amount of carotene ingested. The extinction coeffs. of the Carr-Price reaction and the ultra-violet absorption have been compared, the ratio being of importance in determining the val. of the former in the assay of -A (mean val. 2.60—2.75 for all the species examined). P. G. M.

Occurrence of free vitamin-A alcohol in fish livers. T. H. MEAD (Quart. J. Pharm., 1939, 12, 409—412).—The oils extracted from fresh livers of ling (*Molva molva* and *M. vulgaris*, Day) show marked seasonal variations in the vitamin content; livers from fish caught in the summer contain approx. three times as much vitamin as do livers of fish caught in the spring. Mol. distillation of the oils indicates a content of 1—2% of free -A alcohol which may be formed by hydrolysis although every attempt is made to prevent this after death of the fish. J. N. A.

Vitamin-A deficiency in the dog. W. C. RUSSELL and M. L. MORRIS (J. Amer. Vet. Med. Assoc., 1939, 95, 316—320).—Vitamin-A deficiency was produced in two young dogs in 45 and 47 days. Development of anæmia was probably not related to lack of -A since addition of Fe and Cu to the diet increased the hæmoglobin content and red cell count to normal. E. G. W.

Poor reserves of vitamin-A in the hen's egg and in the liver of young chickens. M. VERMES, P. MEUNIER, and Y. RAOUL (Compt. rend., 1939, 209, 578—581).—Yolks of eggs of well-fed hens contain up to 5100 i.u. of vitamin-A per 100 g., whereas from hens almost completely deprived of green food -A is less than 2500 i.u. The -A content is unchanged after 6 min. in boiling water. Three days after hatching the liver contains 25% of the -A content of the egg. This quantity is lost in about 3 weeks on an -A-free diet. Injection of -A indicates the inability of the liver to store much of the vitamin. Chickens thrive better on repeated small doses than on occasional massive doses of -A. J. L. D.

Determination of vitamin-A in hen's egg. C. A. BAUMANN, J. SEMB, C. E. HOLMES, and J. G. HALPIN (Poultry Sci., 1939, 18, 48—53).—Egg yolks contained 6.6—9.2 µg. of vitamin-A per g. 4 µg. of -A in the yolk prolonged the survival of the hatched chick on an -A-free diet for 1 day. Considerable loss of -A during incubation of eggs is indicated. A. G. P.

Spectrophotometric assay of vitamin-A. C. L. BARTHEN, F. F. BERG, E. B. CARTER, D. M. COPLEY, R. J. FOSBINDER, T. LEWIS, and F. O. TAYLOR (J.

Amer. Pharm. Assoc., 1939, 28, 661—672).—Six samples of liver-oil preps. containing 3—300 × 10³ U.S.P. units of vitamin-A per g. were assayed biologically and, by 13 laboratory staffs working independently, by spectrophotometric methods. Statistical examination of the results show that, when the conversion factor for the reference standard is checked daily and precautions are taken to ensure max. accuracy of measurement, the spectrophotometric method gives results which are in closer agreement than are those obtained by biological assay. With oils of doubtful source, optical examination should be made on the unsaponifiable fraction. F. O. H.

Purity and activity of vitamin-A preparations. P. KARRER (Helv. Chim. Acta, 1939, 22, 1149—1150).—There is no evidence that the vitamin-A prep. of Mead *et al.* (A., 1939, III, 601) is purer than that prepared by the author (A., 1933, 605, 820). H. W.

Vitamin-B requirements of rat. M. M. EL-SADR, H. G. HIND, T. F. MACRAE, C. E. WORR, B. LYTHGOE, and A. R. TODD (Nature, 1939, 144, 73—74).—The rat requires at least six different factors contained in the vitamin-B complex: aneurin, riboflavin, -B₆, and three unidentified substances for which extraction methods are given. The growth effect of β-alanine is insignificant. W. F. F.

Vitamin-B factors. H. VON EULER, M. MALMBERG, and F. SCHLENK (Arkiv Kemi, Min., Geol., 1939, 13, A, No. 10, 8 pp.).—The prep. of a vitamin-B-complex filtrate free from nicotinamide and its derivatives and particularly from cozymase could not be effected by adsorption on fuller's earth or C or by extraction with butanol since a further -B component behaves similarly to nicotinamide and cozymase and is separated with them. The filtrate cannot therefore be built up to a completely active -B complex by addition of cozymase alone. B-avitaminotic rats regain the normal content of nicotinamide after feeding with yeast extract. H. W.

Vitamin-B₁ and carbohydrate metabolism. A. MORELLI and L. D'AMBROSIO (Boll. Soc. ital. Biol. sperim., 1939, 14, 401—403).—Subcutaneous injection of vitamin-B₁ (500—1000 i.u.) into guinea-pigs increases blood-sugar and diminishes liver-glycogen. F. O. H.

Metabolic interdependence of vitamin-B₁ and manganese. Reciprocal neutralisation of their toxic effects. D. PERLA and M. SANDBERG (Proc. Soc. Exp. Biol. Med., 1939, 41, 522—527).—Rats receiving 100 µg. or more of vitamin-B₁ daily lose fertility and develop cannibalism (cf. A., 1938, III, 129). Similar results follow administration of 2 mg. daily of Mn, but feeding with this dose of Mn plus 400 µg. of -B₁ produces no toxic effects. V. J. W.

Analysis of symptoms of polyneuritis in vitamin-B₁ deficiency in the light of chemical theory of nervous processes. C. S. KOSCHTOJANZ (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 357—359).—Vitamin-B₁ deficiency leads to a disturbance of carbohydrate metabolism, arresting it at the pyruvic acid stage, and this stimulates the synthesis of acetylcholine which controls nervous processes. P. G. M.

Avitaminosis- B_1 and pigeon brain potentials. E. TOKAJI and R. W. GERARD (Proc. Soc. Exp. Biol. Med., 1939, 41, 653—655).—Normal brain shows rhythms at 10—25 per sec. of 10—30 μ v., and at 2—5 per sec. of 80—100 μ v. In vitamin- B_1 -deficient pigeons the faster rhythm is unchanged but the slower may be doubled in amplitude, this symptom disappearing in 2 hr. after $-B_1$ injection. V. J. W.

Insects as test animals for nutritional and vitamin studies. B. G. L. SWAMY and M. SREENIVASAYA (Current Sci., 1939, 8, 365—367).—The larvæ of the rice moth (*Corcyrus* sp.) exhibit very poor development on a vitamin- B_1 -free diet. Development is normal on whole jowar, but is poor on jowar extracted with ether or alcohol. Addition of the extract to a $-B_1$ -deficient diet restores normal development. J. L. D.

Chemical composition and vitamin content of royal jelly. R. M. MELAMPY and D. B. JONES (Proc. Soc. Exp. Biol. Med., 1939, 41, 382—388).—The special food causing development of larval bees into queens contains 12.34% of proteins and 12.49% of reducing substance. It contains 1—1.5 i.u. of vitamin- B_1 per g. but no $-A$, $-C$, or $-E$. V. J. W.

Determination of vitamin- B_1 in cerebrospinal fluid. H. M. SINCLAIR (Biochem. J., 1939, 33, 1816—1821).—Vitamin- B_1 circulates in the free form in the plasma and in c.s.f., in both of which the concn. is 0.0—1.3 μ g. per 100 c.c. The concn. in human blood cells is 7 times as great, and it is all in the phosphorylated form. Higher vals. are given by pathological samples of fluid, and show a correlation with the leucocyte count. The method of determination used is similar to that described by the author for blood (A., 1939, III, 165). P. G. M.

Determination of a curve of response to synthetic crystalline thiamin for use in the vitamin- B_1 assay of foods by the rat growth method. C. D. MILLER (J. Nutrition, 1939, 17, 535—544).—Growth curves obtained by feeding graded doses of thiamin to previously depleted rats show a curvilinear relation between the gain in wt. after 3 and after 5 weeks and the amount of thiamin given. The bearing of the data on rat methods of assay is discussed. When supplements of 1—4 μ g. of thiamin are fed to groups of 12 rats 6 times a week the response should be sufficiently accurate to distinguish differences of 1 μ g. A. G. P.

Vitamin- B_1 content and antineuritic activity.
I. **Sunflower seeds.** II. **Fruit of *Rosa canina*.** L. CALLEGARI (Boll. Soc. ital. Biol. sperim., 1939, 14, 484—486, 486—487).—I. Whilst the thiochrome method indicates that the seeds contain approx. 1.7 i.u. per g., feeding experiments on pigeons show that the available vitamin- B_1 is negligible.

II. The thiochrome method gives a $-B_1$ content of 0.6 i.u. per g. of dried fruit but addition of the fruit to a $-B_1$ -free diet accelerates the onset of polyneuritis in pigeons. F. O. H.

Nutritive value of dried tomato pomace. W. B. ESSELEN, jun. and C. R. FELLERS (Poultry

Sci., 1939, 18, 45—47).—The pomace is a good source of vitamin- B_1 and a moderate source of $-A$ and $-B_2$. A. G. P.

Thiochrome method for determining vitamin- B_1 . L. CALLEGARI (Boll. Soc. ital. Biol. sperim., 1939, 14, 487—488).—Precautions necessary to obtain comparable results between solutions of cryst. vitamin- B_1 and test solutions of $-B_1$ when using the thiochrome method are described. F. O. H.

Effect of vitamin- B_2 on blood regeneration in experimental anæmia. M. BALZAR and G. MICHEL-ANGIOLI (R. Ist. San. Pubbl., 1939, 2, 517—532).—Rats on a vitamin- B_2 -free diet show less resistance to the anæmia-producing effect of pyridine than do rats on a complete diet, whilst administration of $-B_2$ complex from yeast enhances blood regeneration in anæmic rats. F. O. H.

Adrenal atrophy and senescence produced by vitamin[$-B_2$] deficiency. A. F. MORGAN and H. D. SIMMS (Science, 1939, 89, 565—566).—Changes resembling those of senescence were observed in rats with avitaminosis- B_2 . The signs are not relieved by administration of vitamin- B_1 , $-B_6$, riboflavin, Cu, Fe, or by nicotinic acid or adrenaline. Cure is effected by doses of adrenal cortex extract. W. F. F.

Lesions of nervous system in pigeons with beriberi. V. CAPRARO (Boll. Soc. ital. Biol. sperim., 1939, 14, 479—481).—Lesions in the sciatic-femoral nerves are described. F. O. H.

Rôle of riboflavin and other factors of the vitamin- B complex in the nutrition of pigs. E. H. HUGHES (J. Nutrition, 1939, 17, 527—533).—Diets deficient in riboflavin produced slow growth and a crippled condition (not rickets) in pigs. Administration of riboflavin improved growth but did not cure the crippled condition. Confirmatory evidence that thiamin is essential for growth of pigs is presented. Rice-bran filtrate factor 1 or 2 is probably necessary in the nutrition of pigs. A. G. P.

Reponses to various levels of intake of riboflavin. H. C. SHERMAN and L. N. ELLIS (Proc. Nat. Acad. Sci., 1939, 25, 420—422; cf. A., 1934, 333).—Rate of growth and vitality in first generation rats are not affected by administration of more than approx. 3 times the min. adequate dose of riboflavin but are increased in their offspring by approx. 7—10 times that dose. It is suggested that growth alone is an incomplete measure of well-being and that the concept of the nutritional improvability of the chemical composition and condition of the tissue of the normal organism may be of val. in the study of biological chemistry. W. McC.

Nicotinic acid in swine nutrition. L. C. MADISON, R. C. MILLER, and T. B. KEITH (Science, 1939, 89, 490—491).—A nutritional disorder simulating swine pellagra is reported as occurring under ordinary agricultural conditions. W. F. F.

Effect of nicotinic acid on blood-sugar. D. GRECO (Boll. Soc. ital. Biol. sperim., 1939, 14, 403—405).—Intravenous injection of 5—15 mg. per kg. of nicotinic acid into fasting dogs increases blood-sugar; 15 mg. increases the level from 0.1 to 0.15%, the max.

with all doses being attained after 2 hr. and normal levels again after 4 hr. Higher doses or injections into glucose-fed dogs are without effect on blood-sugar. F. O. H.

Effect of nicotinic acid deficiency on co-enzyme I content of animal tissues. A. E. AXELROD, R. J. MADDEN, and C. A. ELVEHJEM (J. Biol. Chem., 1939, **131**, 85—93; cf. A., 1939, III, 495).—A deficiency of nicotinic acid in the dog and pig results in a decreased amount of co-enzyme I in the liver and muscles, whilst the amount in brain, kidney cortex, and blood is unaffected. It is assumed that a normal level of co-enzyme I in these is absolutely essential for life. The co-enzyme I content of rat tissues cannot be increased by administration of large amounts of nicotinic acid. J. N. A.

Determination of nicotinic acid in urine. F. DEL REGNO (Boll. Soc. ital. Biol. sperim., 1939, **14**, 398—400).—Application of Swaminathan's method (B., 1939, 974) is described. Normal excretion of the acid is approx. 0.14 mg. (rat) and 1 mg. (man) per 100 c.c. of urine. F. O. H.

Therapeutic action of nicotinic acid. C. M. VALERI (Boll. Soc. ital. Biol. sperim., 1939, **14**, 556—557).—Results in non-pellagic cases are discussed. F. O. H.

Determination of nicotinamide in animal organs. P. KARRER and H. KELLER (Helv. Chim. Acta, 1939, **22**, 1292—1293).—Modifications in the technique of a previously published method (A., 1938, II, 302) are given. H. W.

Effect of cocarboxylase on metabolism and neuro-psychiatric phenomena in pellagrins with beriberi. F. H. LEWY, H. E. HEWICH, J. P. FROSTIG, and T. D. SPIES (Science, 1939, **90**, 141).—In 8 cases the neuropathy of pellagra was distinct from that of nicotinic acid or riboflavin deficiency. After administration of thiamin pyrophosphate there was improvement in the affected peripheral and cranial nerves. W. F. F.

Relationship of P-P factor to intestinal mobility. L. A. CRANDALL, jun., F. F. CHESLEY, D. HANSEN, and J. DUNBAR (Proc. Soc. Exp. Biol. Med., 1939, **41**, 472—474).—Intestinal irregularities in patients were benefited by administration of nicotinic acid, and dogs on a diet causing blacktongue showed excessive gut movements. V. J. W.

Red pigments of pellagra urines. C. J. WATSON (Proc. Soc. Exp. Biol. Med., 1939, **41**, 591—595).—The pigment of the Beckh-Ellinger-Spies test (A., 1938, III, 316) is not porphyrin but uroresin (A., 1883, 101) or its chromogen indolylacetic acid. The urines may also contain a pigment which can be extracted by toluene which is probably indirubin. V. J. W.

Anti-acrodynic properties of certain foods. H. A. SCHNEIDER, J. K. ASCHAM, B. R. PLATZ, and H. STEENBOCK (J. Nutrition, 1939, **18**, 99—104).—The vitamin- B_6 content of 54 food materials is determined. Vals. were high in certain vegetable fats and in legume and cereal seeds, moderate in fish and meat products, and low in fruits and vegetables. A. G. P.

Maintenance nutrition in the pigeon. Presence of dietary essentials in yeast and liver and their relationship to vitamin- B_6 . C. W. CARTER and J. R. O'BRIEN (Biochem. J., 1939, **33**, 1810—1815).—The prep. of concentrates of fuller's earth eluate and filtrate factors from yeast and liver is described. Both are required by the pigeon in addition to vitamin- B_1 and - B_2 . The filtrate factor of yeast is not effective when supplemented only by - B_1 and - B_2 , requiring in addition either the eluate factor or - B_6 . The fact that the eluate factor is a more effective supplement than - B_6 is probably explained by the existence of an additional factor in eluate fractions rather than by inadequate dosage of - B_6 . P. G. M.

Ascorbic acid intake required to maintain tissue saturation in normal adults. W. B. BELSER, H. M. HAUCK, and C. A. STORVICK (J. Nutrition, 1939, **17**, 513—526).—A method of ascertaining the min. intake of ascorbic acid necessary to maintain tissues in a state of saturation is described. The min. requirement for 7 subjects examined ranges from 1.0 to 1.6 mg. per kg. body-wt. High environmental temp. tended to diminish and atropine administration to increase urinary excretion of ascorbic acid. A. G. P.

Effect of large doses of ascorbic acid on normal adults. F. ADDARIO and E. JASONNI (Boll. Soc. ital. Biol. sperim., 1939, **14**, 565—567).—The slight disturbances (studied in 26 adults) due to intravenous injection of 0.5—1.5 g. of ascorbic acid (as Na salt) are discussed. Hypervitaminosis-C is not a toxic condition. F. O. H.

Vitamin-C requirements of children. W. TOBLER (Schweiz. med. Wschr., 1939, **69**, 677—679).—A lecture. A. S.

Vitamin-C and blood complement. R. MACCOLINI (Boll. Soc. ital. Biol. sperim., 1939, **14**, 389—391).—Avitaminosis-C or administration of large doses of -C has no significant effect on serum-complement (tested with sheep erythrocytes—sheep hæmolytic antiserum) in guinea-pigs. F. O. H.

Possible carrier rôle of ascorbic acid in animal tissues. M. O. SCHULTZE, C. J. HARRER, and C. G. KING (J. Biol. Chem., 1939, **131**, 5—12).—Ascorbic acid does not act as a H transfer agent in a system containing nicotine hæmochromogen, ascorbic acid, co-enzyme, glucose, and glucose dehydrogenase. Presence of glutathione with or without ascorbic acid does not cause the latter to act as a transfer agent, although both are oxidised aëroically in presence of the hæmochromogen. Reduced cozymase does not reduce dehydroascorbic acid *in vitro* at p_H 7.2 either in pure solution or in presence of dialysed suspensions of rat liver or muscle. J. N. A.

Effect of ascorbic acid on oxidation processes in the central nervous system. I. Effect of lowering the ascorbic acid content of the diet on oxidative processes in guinea-pig's brain. J. V. LACHNO (Ukrain. Biochem. J., 1939, **13**, 461—474).—The water content of guinea-pig's brain rises in the order brain stem, cerebellum, cerebrum. The intensity of reduction of methylene-blue and of

catalase activity decrease in the order cerebellum, cerebrum, stem. Withdrawal of ascorbic acid from the diet does not affect the intensity of these processes.

R. T.

**Sugar consumption of normal, C-hyper-
vitaminotic, and scorbutic guinea-pig hearts.** Z. ASZÓDI and L. SAS (Magyar Orr. Arch., 1939, 40, 177—182).—Hearts of animals suffering from scurvy show a higher, and those of C-hypervitaminotic animals a lower, degree of sugar consumption than normal. In scurvy the whole metabolism and sugar consumption are increased. This may be due to hyperfunction of the thyroid gland.

A. W. M.

**Metabolism in guinea-pigs during experi-
mental scurvy. I. Utilisation of carbohydrates,
lipins, and proteins. II. Calcium and phos-
phorus balance.** L. CIOGLIA and F. INFANTELLINA (Boll. Soc. ital. Biol. sperim., 1939, 14, 410—411, 411—412).—I. Scurvy is accompanied by diminished utilisation of protein-N and, to a smaller extent, of fat; carbohydrate metabolism appears to be unchanged.

II. Scurvy produces disturbances of the Ca-P balance.

F. O. H.

**Vitamin-C studies in the rat. Effect of copper
and various organic substances.** J. L. SVIRBELY (J. Biol. Chem., 1939, 131, 233—241).—The effect of feeding substances which interfere with normal metabolic activities of the organs of the rat on their concn. of vitamin-C is described. Variations in the wt. of the organs which result from feeding of foreign substances must be corr. for.

H. G. R.

**Connexion between ascorbic acid and tissue
lipase.** I. B. ENTIN (Ukrain. Biochem. J., 1939, 13, 275—310).—The lipolytic activity of the liver falls in the order guinea-pig, rabbit, suslik, cat, dog, pigeon, hen, sparrow, crayfish, rat, frog, carp, newt, grass snake, tortoise; with the exception of the guinea-pig and rabbit the same order is found for ascorbic acid content. Both ascorbic acid content and lipolytic activity are raised, to a parallel extent, by feeding high ascorbic acid diets to guinea-pigs, but not rats. Thyroid feeding causes a parallel fall in the lipolytic activity and ascorbic acid content of rabbit liver. The lipolytic activity of guinea-pig liver is lowest in the autumn and highest in summer, whilst the reverse is the case with ascorbic acid content. The data are on the whole consistent with the view that ascorbic acid is essential for development of lipolytic activity.

R. T.

Ascorbic acid content of rat placenta. B. I. GOLDSTEIN and D. V. VOLKENZON (Ukrain. Biochem. J., 1939, 13, 311—316).—The ascorbic acid content falls with increasing age of the embryo.

R. T.

**Tissue-ascorbic and -dehydroascorbic acid
content of rats and guinea-pigs of different ages.** K. R. KRATINOVA and R. B. BOSIS (Ukrain. Biochem. J., 1939, 13, 317—329).—The ascorbic and dehydroascorbic acid contents of various organs of the rat and the guinea-pig fall steadily with increasing age of the animal. Except in the case of guinea-pig's skin this affects the oxidised more than the reduced form of ascorbic acid. Dehydroascorbic acid is absent

from rat brain, and is present only in traces in guinea-pig brain.

R. T.

Dilemma in vitamins. V. STEFANSSON (Science, 1939, 89, 484—485).—Exclusive meat eaters among primitive peoples do not obtain sufficient vitamin-C yet never exhibit signs of avitaminosis-C.

W. F. F.

Vitamin-C sources in Eskimo food. A. HØYGAARD and H. W. RASMUSSEN (Nature, 1939, 143, 943).—The Angmagssalik Eskimos get a daily average of 40 mg. of ascorbic per adult, 50% from marine algae and 50% from animal sources. Scurvy is unknown among them.

W. F. F.

**Reducing power of fruit juices during matur-
ation.** L. GATET (Enzymologia, 1939, 6, 375—386).—The reduction of dichlorophenol-indophenol is due to the ascorbic acid content alone with orange juice; with grape juice, however, it is due to ascorbic acid together with other substances, one of which has antiscorbutic properties.

E. M. W.

**Blockage and transfer of reducing hydrogen.
I. Reducing hydrogen of dichlorophenol-indo-
phenol.** L. GENEVOIS and P. CAYROL (Enzymologia, 1939, 6, 352—374).—The reduction of dichlorophenol-indophenol by cysteine, glutathione, and other compounds is inhibited specifically by blocking the reducing H with suitable substances. A method of analysis is based on this. Dehydroascorbic acid and alloxan are very rapidly reduced by thiol derivatives and hydrazines. Glutathione is a protective agent for ascorbic acid in tissues.

E. M. W.

Stability of ascorbic acid in certain acids. M. M. EIDELMAN (Ukrain. Biochem. J., 1939, 13, 715—732).—The ascorbic acid content of trichloroacetic acid extracts of plant and animal tissues falls rapidly, owing to oxidation by Cl liberated from the trichloroacetic acid, decomp. of which is prevented by HCl. For this reason, a suitable medium for extraction of ascorbic acid is 4% trichloroacetic acid in 0.15N-HCl or 0.002% HPO₃. In presence of Cu, H₂SO₄ and trichloroacetic acid stabilise ascorbic acid solutions.

R. T.

**Determination of vitamin-C nutrition by a
skin test.** G. A. GOLDSMITH, D. F. GOWE, and A. T. OGAARD (Proc. Soc. Exp. Biol. Med., 1939, 41, 370—374).—In 100 experiments there was no correlation between blood-ascorbic acid and decolorisation time of intradermal 2:6-dichlorophenol-indophenol.

V. J. W.

**Determination of ascorbic acid in faeces.
Its excretion in health and disease.** H. CHINN and C. J. FARMER (Proc. Soc. Exp. Biol. Med., 1939, 41, 561—566).—Indophenol-reducing substances are determined before and after destruction of ascorbic acid by an oxidase, the difference giving the ascorbic acid content. Normal faecal excretion is 5 mg. daily and is only slightly affected by increased intake. It is increased in gastro-intestinal disorders.

V. J. W.

Colorimetric determination of vitamin-C. E. SOHULEK and J. FLODERER (Angew. Chem., 1939, 52, 615—616).—The method depends on the reduction of Fe⁺⁺⁺ by ascorbic acid in neutral or slightly acid

solution to Fe^{++} , which is converted into its stable complex with 2:2'-dipyridyl. 0.1 g. of Fe alum is dissolved in 100 c.c. of 20% H_3PO_4 . 2 c.c. of this solution are treated with 1% aq. citric acid (10 c.c.), 1% solution of 2:2'-dipyridyl in alcohol (0.4 c.c.), and 20% aq. NH_4 acetate (10 c.c.). A known vol. of the test solution is then added, and the mixture is kept in the dark for 2 hr. The solution is then made up to 100 c.c. and its extinction coeff. measured photometrically in a 30-mm. tube with colour filter S. 50, comparison being made with a blank solution prepared by using ethyl alcohol instead of the solution of 2:2'-dipyridyl. 0.01 g. of cystine, glutathione, or vitamin- B_1 shows no reducing action on Fe^{+++} under similar conditions. J. W. S.

Vitamin-D requirements of young turkeys. T. H. JUKES and T. D. SANFORD (J. Nutrition, 1939, 18, 71—85).—A linear relationship between the amount of vitamin-D in the diet and the ash of turkey bones is established for the range 20—100 i.u. per 100 g. of diet. Growth rates of turkeys were markedly increased by feeding -D. Satisfactory growth was obtained with a supplement of 0.4 g. of a fish oil blend per 100 g. of diet. The oil fed to chicks with the same diet supplied 450—460 i.u. of -D per g. of oil. The average turkey/chick efficiency ratio of the oil was 140 (cod-liver oil = 100). A. G. P.

Bone development in normal and rachitic rats. W. C. RUSSELL, M. W. TAYLOR, and M. T. DUNCAN (J. Nutrition, 1939, 18, 27—33).—The width of the epiphyseal cartilage of normal rat radii decreased continuously with advancing age, reaching a const. level in 36-day animals. In 24-day rats placed on a rachitogenic diet narrowing of the cartilage ceased after 3 days and widening proceeded for 18—27 days, after which no further change occurred. A. G. P.

Cereals and rickets. IX. Availability of phytin-phosphorus to the chick. J. T. LOWE and C. H. KRIEGER (Poultry Sci., 1939, 18, 40—44).—Phytin added to a low-P diet did not improve calcification in the bones of chicks under conditions in which Na_2HPO_4 of equiv. P content increased the ash of bones by 10%. Results were obtained both in absence and in presence of sub-optimal amounts of vitamin-D. A. G. P.

Beryllium rickets in chickens. H. D. BRANION, F. F. TSDALL, and T. G. H. DRAKE (Poultry Sci., 1939, 18, 66—69).—Addition of $BeCO_3$ to chick rations induced poor calcification and bone development, and low plasma-inorg. P and bone ash. Chicks are more resistant than rats to Be rickets. A. G. P.

Rachitogenic diets composed of purified food materials. J. H. JONES (J. Nutrition, 1939, 17, 601—609).—Various appropriate low-P diets are described; blood-fibrin serves as protein in most cases. A fair degree of rickets is produced if casein is used in amounts not exceeding 12% of the ration. The antirachitic property of casein is entirely due to its P content. Severe rickets in rats receiving a diet containing 3% of $CaCO_3$ is produced if the P content does not exceed 0.1%. A. G. P.

Individual and breed variations in pigs on rations devoid of vitamin-D. D. W. JOHNSON and L. S. PALMER (J. Agric. Res., 1939, 58, 929—939).—Coloured pigs having previous access to outdoor conditions stored sufficient vitamin-D to protect them from rickets for 4—8 weeks. White or nearly white pigs under similar conditions were protected for nearly twice as long. Depletion of -D is accompanied by lowered plasma-Ca, loss of appetite, poor condition, and finally by Ca tetany. A. G. P.

Pemphigus controlled by vitamin-D. H. KING and C. M. HAMILTON (Arch. Dermatol. Syphilol., 1939, 39, 515—517).—A case of pemphigus is reported. The condition was apparently controlled by 100,000 U.S.P. units of vitamin-D daily. With 300,000 units daily untoward symptoms occurred. C. J. C. B.

Vitamin-D content of colostrum in cows. J. VAN NIEKERK and M. S. C. BLIEK (Acta brev. neerl. Physiol., 1939, 9, 25—26).—Vitamin-D content in fat of colostrum was 250 i.u. per l. in a cow kept indoors and 116 and 140 units in animals grazing in the field. Milk fat contained 18 and 25 units (tested on young rats). A. S.

Reduced muscle-creatine in paralysed young [vitamin]-E-low rats. I. R. TELFORD, G. A. EMERSON, and H. M. EVANS (Proc. Soc. Exp. Biol. Med., 1939, 41, 315—318).—Muscles of suckling rats of vitamin-E-deficient mothers contained 152 mg.-% of creatine as compared with 245 mg.-% of controls. V. J. W.

Effect of wheat-germ oil on vitamin-E-deficient muscular dystrophy. G. C. KNOWLTON, H. M. HINES, and K. M. BRINKHOU (Proc. Soc. Exp. Biol. Med., 1939, 41, 453—456).—Rats showing muscle necrosis at 5 months recovered completely in 3 months with wheat-germ oil feeding. V. J. W.

Rôle of vitamin-E in prevention of muscular dystrophy in guinea-pigs reared on synthetic rations. N. SHIMOTORI, G. A. EMERSON, and H. M. EVANS (Science, 1939, 90, 89).—Guinea-pigs in which avitaminosis-E develops exhibit muscular dystrophy which is prevented by α -tocopherol. W. F. F.

Alimentary exudative diathesis, a consequence of E-avitaminosis. H. DAM and J. GLAVIND (Nature, 1939, 143, 810—811).—Direct test of *dl*- α -tocopherol demonstrated that vitamin-E gives protection to chicks against alimentary exudative diathesis (cf. A., 1939, III, 292). -E may be assayed by its anti-exudative activity. W. F. F.

Nutrition with *Pisum sativum*. II. N. C. NAG and A. K. PAIN (Trans. Bose Res. Inst., 1936—7, 12, 43—45; cf. A., 1938, III, 673).—*P. sativum* is deficient in vitamin-E. The deficiency (in rats) was not rectified by mixing with an equal wt. of *Cicer arietinum*. Complete change of diet restored procreative powers of the deficient rats. Progeny reached maturity but were subnormal in wt. A. G. P.

Vitamin-E. XIII. Specificity and relationship between chemical structure and vitamin-E activity. H. M. EVANS, O. H. EMERSON, G. A. EMERSON, L. I. SMITH, H. E. UNGNADE, W. W. PRICHARD, F. L. AUSTIN, H. H. HOEHN, J. W. OPIE,

and S. WAWZONEK (J. Org. Chem., 1939, 4, 376—388; cf. A., 1939, II, 440).—Of ten representatives of the chromans, other than the tocopherols, only 2 : 2-diethylchroman is physiologically active. The activity of the tocopherols depends greatly on the nature of the long aliphatic side-chain, but other factors are also important. Of five coumarans, only 1-methyl- and 1 : 1 : 6-trimethyl-coumaran are active, these again being the simplest members of their class. Coumarin and 6-hydroxy-5 : 7 : 8-trimethyl-3 : 4-dihydrocoumarin are inactive, but 6-hydroxy-3-carbethoxy-5 : 7 : 8-trimethylcoumarin is active. 5-Hydroxy-2 : 4 : 6 : 7-tetramethylcoumarone is active. *o*-Allylphenol is active, whilst di-*o*-hexenylphenol and its cyclisation product are inactive. Although quinones and quinols have no heterocyclic ring, the highest % of active compounds is found among them. Quinol and trimethylquinol are inactive, but duroquinone and duroquinol as well as *o*-xyloquinol and 2 : 3-dimethyl-5 : 6 : 7 : 8-tetrahydro- α -naphthaquinol are active. Phytol is inactive either alone or when fed with quinol. Active quinol ethers are derived from tetramethyl- (active) and trimethyl- (inactive) -quinol. Among them are found those with short as well as long chains and, with the dihydrochaulmoogryl ethers, a long chain with an isocyclic ring. For the manifestation of *-L* activity, it appears that a certain structural skeleton must be present, an important function of which is to provide for a ready conversion of the substance into an oxidation-reduction system with a potential within certain limits. It must also contain accessory groups of such a nature that the compound has the solubility properties enabling it to be absorbed and transported to the place where it is to be used. It must further be assumed that the organism can carry out the necessary chemical transformations involved which, however, all come within a few groups of well-known biological actions.

H. W.

Vitamin-K activity of synthetic phthiocol. E. FERNHOLZ and S. ANSBACHER (Science, 1939, 90, 215).—The vitamin-K activity of phthiocol is to a large extent due to traces of an impurity, 2-methyl-1 : 4-naphthaquinone, which has great *-K* potency.

W. F. F.

Derivative of vitamin-K₁.—See A., 1939, II, 554.

Dietary requirements for lactation. VIII. Effect of withdrawal of vitamin-L during lactation. W. NAKAHARA, F. INUKAI, and S. UGAMI. **IX. Vitamin-L deficiency in mice.** W. NAKAHARA, F. INUKAI, S. UGAMI, and K. TAKAHASHI. **X. Methods of testing for vitamin-L.** W. NAKAHARA, F. INUKAI, and S. UGAMI (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1939, 36, 312—317, 318—326, 327—334; cf. A., 1938, III, 418, 599; Folley *et al.*, A., 1938, III, 1023).—VIII. In lactating rats, withdrawal of vitamin-L₁ from the diet at the end of the 2nd week of lactation results in high mortality in the young during the 3rd week only if, prior to the withdrawal, the *-L*₁ content of the diet is only just sufficient for maintenance of lactation.

IX. In order to cause high mortality, due to vitamin-L deficiency, in infant mice, the diet of the mothers must be deficient in *-L* for at least 90 days

prior to parturition. Some increase in mortality results when the period is 29—35 days. The *-L* requirement of mice is less than that of rats. When the period is greater than 90 days inadequacy of lactation does not become more severe, possibly because of the difficulty of rendering diets *-L*-free.

X. A diet of powdered polished rice, fish protein, butter, and salt mixture supplemented with a vitamin-L-deficient baker's yeast produces *-L*₁ deficiency but is otherwise adequate. The same diet, supplemented with acid earth adsorbate from extract of baker's yeast or with this adsorbate and material not adsorbed by the earth from liver extract, produces deficiency of *-L*₁ + *-L*₂ or *-L*₂ only, respectively. The stock diet given before the deficient diet must not be rich enough in *-L* to allow much *-L* to be stored in the body and administration of the deficient diet must begin not less than 4—5 weeks before parturition. Virgin rats must be used. Brewer's yeast is not sufficiently poor in *-L* for use as a vitamin-B source in the diet. *-L* is essential for lactation but is not a galactagogue. The only method of detecting *-L* is to render animals deficient and to test the effect of dietary supplements on lactation. W. McC.

(xix) METABOLISM, GENERAL AND SPECIAL.

Metabolism of workers in rice fields. R. MARGARIA and G. PORRI (Arch. Sci. biol., Napoli, 1939, 25, 201—207; cf. A., 1939, III, 404).

S. O.

Prediction of basal heat production from urinary creatinine. N. B. TALBOT, A. H. STEWART, and F. BROUGHTON (Amer. J. Dis. Child., 1938, 56, 965—968).—From a study of the creatinine in the urine and the heat production in 15 normal boys and 27 normal girls it is concluded that the urinary creatinine may be used as a standard of reference for the prediction of normal heat production.

C. J. C. B.

Magnesium and muscle respiration. S. ELDEN (Biochem. J., 1939, 33, 1890—1894).—The stimulating action of boiled muscle extracts on muscle respiration cannot be explained only as a result of the Mg and dicarboxylic acid contents; co-enzyme I is also involved. Mg may act either only as a cophosphorylase or as an activator of *isocitric* dehydrogenase, or in both ways. The succinic acid-Mg effect is completely inhibited by 0.001M-iodoacetic acid after a latent period of about 30 min. P. G. M.

Rôle of adenosinetriphosphoric acid in the anaërobic carbohydrate metabolism of muscle. E. J. RASCHBA (Ukrain. Biochem. J., 1939, 13, 425—443).—A review. R. T.

Morphogenesis and metabolism : studies with the Cartesian diver ultramicromanometer. I. Anaërobic glycolysis of regions of amphibian gastrula. E. J. BOELL, J. NEEDHAM, and V. ROGERS. II. Effect of dinitro-*o*-cresol on anaërobic glycolysis of regions of amphibian gastrula. III. Respiratory rate of regions of amphibian gastrula. E. J. BOELL and J. NEEDHAM. IV. Respiratory quotient of regions of amphibian gastrula. E. J. BOELL, H. KOCH, and J. NEEDHAM

(Proc. Roy. Soc., 1939, B, 127, 322—356, 356—362, 363—373, 374—387).—I. With the Cartesian diver described it is possible to measure changes of the order of 10^{-6} c.c. of gas. The instrument is about 1500 times as sensitive as the Warburg manometer. The method of calibration and the procedures involved in measuring the anaerobic glycolysis of pieces of amphibian embryo tissue of about 100 μ g. dry wt. are described. The region of the organisation centre of the amphibian gastrula has an anaerobic glycolysis and an anaerobic NH_3 production about three times as high as has the ventral ectoderm.

II. Dinitro-*o*-cresol diminishes the difference between the metabolic activity of dorsal lip region and the ventral ectoderm. The uncompensated CO_2 production of the ventral ectoderm rises by nearly 300%, whilst that of the dorsal lip region rises by only 35%. The NH_3 production of the dorsal lip region is not affected while that of the ventral ectoderm increases by 57%.

III. The respiratory rate of the dorsal lip region is the same as that of the ventral ectoderm from gastrula of *Discoglossus* and *Amblystoma*.

IV. In *Amblystoma* blastula isolate has a R.Q. about 0.7 and neurula isolate has R.Q. about 1. During the gastrulation process the R.Q. of the dorsal lip region reaches 1 much more quickly than does that of the ventral ectoderm. The R.Q. of the ventral ectoderm probably does not reach 1 before the latter becomes completely underlain by mesoderm from the sides of the blastopore opening.

F. B. P.

Effect of spermine on tissue oxidations.

E. A. EVANS, jun., B. VENNESLAND, and J. J. SCHNEIDER (Proc. Soc. Exp. Biol. Med., 1939, 41, 467—470).—0.0015M-Spermine added to guinea-pig brain tissue and glucose in phosphate saline diminishes O_2 consumption by 51—62% per 30 min. Similar inhibition occurs with lactate or pyruvate substrate, but not with glutamate or succinate.

V. J. W.

Measurement of respiration of animal tissues by Warburg's method. O. P. TSCHERINOGA (Ukrain. Biochem. J., 1939, 13, 693—713).—Known methods are described.

R. T.

Significance of unimolecular layers of fatty acids in the control of animal oxidation. J. M. O'CONNOR (Proc. Roy. Irish Acad., 1939, 45, B, 355—371).—The factors which determine the metabolic rate of an animal are discussed and it is considered probable that its constancy under given conditions depends on control of O_2 consumption and not of energy production. A method for determination of O_2 consumption of frogs at various temp. is described. The relationship between temp. and O_2 consumption cannot be represented by the Arrhenius equation, but the effects observed can be explained by a variation in activity of the controlling catalyst. A marked rise in O_2 consumption occurs at 6—14°, a sharp rise about 15°, and then an increase, resembling the first, at 21—30°. These temp. correspond with the expansion of a unimol. layer of myristic, the m.p. of a unimol. layer of palmitic, and the expansion of a unimol. layer of palmitic acid, respectively. The change in O_2 consumption with

temp. corresponds with the pressure changes which might be exerted in a unimol. layer containing fatty acids. The proportionate increases in O_2 consumption at 6—14° and 21—30°, respectively, agree with the relative amounts of myristic and palmitic acids present in the reserve fat of frogs. The rates of O_2 consumption at various temp. can be changed by feeding pure fatty acids and the changes are such as would be expected from alteration in the amounts of fatty acids in tissues. Hence the rate of oxidation in animal tissues is controlled by the conditions in a film of fatty acids adsorbed on the surface of a controlling catalyst.

J. N. A.

Metabolism of *N*-alkyl derivatives of amino-acids. H. E. CARTER and P. HANDLER (Proc. Soc. Exp. Biol. Med., 1939, 41, 347—348).—A no. of methyl derivatives of amino-acids were given to young rats in place of amino-acids. The only one able to support growth is *N*-methyl-*l*-phenylalanine.

V. J. W.

Metabolism of sulphur. X. Replaceability of *dl*-methionine in diet of rats with its partly oxidised derivative, *dl*-methionine sulphoxide. M. A. BENNETT (Biochem. J., 1939, 33, 1794—1797).—*dl*-Methionine sulphoxide constitutes a complete replacement for *dl*-methionine in the diet of the rat.

P. G. M.

Urinary elimination of trimethylamine during fasting. F. M. CHIANCONE (Boll. Soc. ital. Biol. sperim., 1939, 14, 560—561).—The urinary excretion of trimethylamine by rats on a normal diet is increased by approx. 200% when the rats are starved.

F. O. H.

Formation of xanthurenic acid from tryptophan in animals. F. M. CHIANCONE (Boll. Soc. ital. Biol. sperim., 1939, 14, 561—562).—The excretion of xanthurenic acid following administration of tryptophan (cf. A., 1935, 1007) occurs more readily in guinea-pigs and rats than in mice.

F. O. H.

Arginine as sole precursor of urea in avian organism. A. CLEMENTI (Boll. Soc. ital. Biol. sperim., 1939, 14, 570—572; cf. A., 1939, III, 406).—The excretion of urea by fowls on a non-protein diet is increased by parenteral administration of arginine, but not by that of alanine, leucine, glycine, asparagine, valine, glutamic acid, $(\text{NH}_4)_2\text{CO}_3$, histidine, or Na nucleate.

F. O. H.

Phosphatide exchange between plasma and organs. L. HAHN and G. HEVESY (Nature, 1939, 144, 204—205).—Radioactive Na_2PO_4 was injected intravenously in rabbits. Exchange of phosphatides occurs with all tissues but mainly with the liver; 3—4% is exchanged with muscle tissue.

W. F. F.

Mechanism of alimentary hyperlipaemia. G. HETÉNYI (Z. ges. exp. Med., 1939, 106, 42—49).—Ingestion of 200 c.c. of cream increases the blood-fat content by 86% (17 healthy subjects); the increase in dogs after injection of 50 g. of olive oil was 52%, in rabbits (after 5 c.c. of oil) 62%. The average increase in 13 cases of obesity was only 16.5%. Fat absorption from the intestines is complete after 7—8 hr. The first increase in fat content was observed in the lungs,

followed by liver and kidneys. Fat depots have a greater avidity for fat in obese than in normal subjects.

A. S.

Altered lipin metabolism in acute infections of infants and of older children. A. V. STOEßER (Amer. J. Dis. Child., 1938, 56, 1215—1230).—42 infants and children with acute infection of the upper respiratory tract and with pneumonia were studied. The fall in total cholesterol level during an acute illness is due to a fall in the ester cholesterol content. Cholesterol ester vals. rapidly returned to normal when the infection subsided. Free serum-cholesterol underwent little change. The relation between the degree of fever and the extent of the fall in the ester cholesterol level was not const. The highest white cell counts were not associated with the lowest cholesterol vals. The moderate decrease in the total fatty acids in acute infections was accompanied by a lowering of the I val. of the serum-fatty acids during the febrile period of the illness compared with the afebrile period of convalescence. In most cases at the onset of the infection, the decrease in the phospholipin content of the serum which occurred during the febrile period of the disease was accompanied by a rise in the I val. of the phospholipin fatty acids. This rise was followed by a marked fall, so that towards the end of the height of the illness, low I vals. were obtained for the fatty acids of the phospholipins. C. J. C. B.

Fat metabolism in sprats. W. NIEMIERKO and C. ŁOSZYCER (Acta Biol. Exp. [Warsaw], 1938, 12, 238—252).—Sprats show the highest fat content during the winter months and the lowest in July. The ratio of unsaturated to saturated fatty acid is 93 : 7 during the winter and 73 : 27 during the summer.

A. S.

Spectrophotometric method for study of fat transport and phosphorylation. E. S. MILLER, R. H. BARNES, J. P. KASS, and G. O. BURR (Proc. Soc. Exp. Biol. Med., 1939, 41, 485—489).—By conjugating the double linking of linoleic acid of corn oil a fat is prepared which can be fed to animals and the quantity of which in the tissues can be determined by the degree of spectral absorption at 2350 Å.

V. J. W.

Formation and breakdown of glycogen in liver. P. OSTERN and E. HOLMES (Nature, 1939, 144, 34).

W. F. F.

Effect of progesterone and other hormones on liver-glycogen. R. GAUNT, J. W. REMINGTON, and A. EDELMANN (Proc. Soc. Exp. Biol. Med., 1939, 41, 429—432).—60 mg. of progesterone or 50 c.c. of adrenal cortex extract (eschatin) doubles liver- without affecting muscle-glycogen in the ferret. The effect is still greater in pseudo-pregnancy. In rats 35 mg. of progesterone or stilbestrol or 50 mg. of testosterone propionate cause no change in liver-glycogen.

V. J. W.

Formation of fat from carbohydrates in fat organs. K. FELIX and W. EGER (Dtsch. Arch. klin. Med., 1939, 184, 446—457).—Addition of glycogen, glucose, pyruvic or lactic acid increases O_2 consumption and CO_2 output of isolated or minced fat (Warburg method). Pyruvic and lactic acid increase the R.Q. of fat above 1, suggesting that synthesis of

fat is occurring. Dihydroxyacetone and glycer-aldehyde also increase the R.Q.

A. S.

Glutathione. X. Effect of glutathione on fever and glycolysis. M. OGAWA (J. Agric. Chem. Soc. Japan, 1939, 15, 775—782; cf. A., 1939, III, 611).—Blood-sugar and body temp. of rabbits begin to rise and reach max. 2 to 3 hr. after injection of glucose, and then subside to normal within 5 to 6 hr. In animals into which 0.1, 0.5, 1.5, and 5.0 mg. of reduced glutathione per kg. of body-wt. is injected intravenously, blood-sugar falls within the first 5, 3.5, 3.0, and 2.5 hr., respectively, and body temp. becomes normal during the next 1, 1, 1, and $\frac{1}{2}$ hr., respectively. Total blood-glutathione is unaffected.

J. N. A.

Storage of glucose in tissues after injection. A. BAISETT, L. BUGNARD, L. CHARLET, and C. SOULA (J. Physiol. Path. gén., 1939, 37, 585—591).—In 4 dogs under anaesthesia and in 2 with cannulae placed *in situ* by London's method of angiostomy, the sugar in portal, hepatic, and femoral veins was determined after intravenous injection of 0.75 g. per kg. of body-wt. The vals. were equal in 3 cases in hepatic and portal veins and less in the hepatic in 2 cases, but in all cases, both vals. were higher than the vals. found for the femoral vein up to 1—2 hr. The tissues therefore play a large part in removing the injected glucose from the circulation. Later the tissue-glucose was restored to the blood, and hence to the liver.

C. A. A.

Tissue-glucose after injection of insulin. A. BAISETT, L. BUGNARD, C. DARNAUD, and C. SOULA (J. Physiol. Path. gén., 1939, 37, 592—596).—In dogs after angiostomy or under anaesthesia, the femoral vein sugar was always less than that of the hepatic or portal veins and the hepatic vein sugar was always greater than that of the portal vein, following injection of insulin. Insulin therefore favours the deposition of glucose in the tissues.

C. A. A.

Causation of low blood-sugar curve in coeliac disease. T. CRAWFORD (Quart. J. Med., 1939, 8, 251—260).—11 of 12 active cases of coeliac disease (ages 1—9) showed typical low oral blood-sugar curves (less than 40 mg. rise after ingestion of 2 g. per kg.). Intravenous blood-sugar curves (0.5 g. of glucose per kg.) showed no significant difference in time of fall to 100 mg.-%, compared with normals of the same age, or with 5 cases of coeliac disease when quiescent. Low curves were therefore assumed due to impaired absorption. Further evidence against abnormal intermediate carbohydrate metabolism as a cause was that the fall of blood-sugar after insulin $\frac{1}{2}$ unit per kg. intravenously showed the same variability in 6 coeliacs as in 6 controls. Carbohydrate starvation was not responsible, for none had ketonuria when the low oral blood-sugar curves were obtained.

R. K.

Diet and detoxication. B. MUKERJI and R. GHOSE (Current Sci., 1939, 8, 411—414).—The normal daily excretion of glycuronide by dogs is 12—40 times as great as by rabbits. Whilst both animals respond to peroral chloral hydrate by an appreciable increase in glycuronide excretion, the dose needed to cause a measurable increase in

excretion during 24 hr. is 250—450 mg. per kg. for rabbits and 100—200 mg. for dogs. Probably glycuronic acid for detoxification purposes can be derived from food sources. The rabbit (herbivorous) cannot synthesise the acid from carbohydrates or amino-acids but utilises the acid from food, whilst the dog (carnivorous) stores glycuronic acid or can synthesise it. Probably the dog effects detoxification by conjugation with glycuronic acid whilst in the rabbit oxidation and/or reduction may preponderate.

J. N. A.

Lactic acid metabolism in developing hen's egg. V. CAPRARO and P. FORNAROLI (Arch. Sci. biol., Napoli, 1939, 25, 279—291).—On incubation of fertilised eggs, the lactic acid in the yolk increases from about 15 to 205 mg.-% in the first 7 days and then decreases, to reach the original val. by the 10th—12th day. In the white the lactic acid increases from 5 to 50 mg.-% in the first 3 days and decreases to the original val. on the 5th day. Later the lactic acid concn. in both yolk and egg-white remains unaltered. No changes in lactic acid occur on incubation of unfertilised eggs. In eggs with retarded development the max. levels of lactic acid are reached later than in normally developing ones. Lactic acid injected into the white of eggs at various stages of development (3—7 days) disappears (5—10 mg. in 20 hr.).

S. O.

Utilisation of lactic acid in eviscerated dogs. E. MILLA and V. CAPRARO (Boll. Soc. ital. Biol. sperim., 1939, 14, 469—471).—Contrary to the views of other workers, the viscera and, in particular, the liver play no part in the removal of lactic acid from the blood.

F. O. H.

Pyruvate oxidation system in brain. I. BANGA, S. OCHOA, and R. A. PETERS (Nature, 1939, 144, 74—75).—Coccarboxylase, fumarate, inorg. phosphate, adenylic acid, and cozymase are required for the oxidation of pyruvate in brain. Fumarate can be replaced by malate or oxalacetate but not by citrate.

W. F. F.

Toxicity of pyruvic acid. V. ZAMBOTTI and A. FERRANTE (Boll. Soc. ital. Biol. sperim., 1939, 14, 370—371).—The marked variation in toxicity of pyruvic acid is due to the conversion of (the more toxic) keto- into the enol form, a change which occurs slowly in the freshly distilled acid.

F. O. H.

Transformation of pyruvic acid from keto- into enol form by vitamin- B_1 . V. ZAMBOTTI and A. FERRANTE (Boll. Soc. ital. Biol. sperim., 1939, 14, 372—373).—The toxic (keto-)form of pyruvic acid in aq. solution is diminished in toxicity by *in-vitro* treatment with vitamin- B_1 . The conversion of keto- into enol form by $-B_1$ is confirmed by polarographic analysis.

F. O. H.

Utilisation of pyruvic acid in heart-lung preparations. P. FORNAROLI and V. CAPRARO (Boll. Soc. ital. Biol. sperim., 1939, 14, 472—474).—Pyruvic acid added to blood circulating through the prep. disappears completely within 1 hr.; simultaneous formation of lactic acid occurs.

F. O. H.

Utilisation of pyruvic acid in eviscerated dogs. V. CAPRARO and E. MILLA (Boll. Soc. ital. Biol.

sperim., 1939, 14, 554—556).—As with lactic acid (see above), the viscera and, in particular, the liver do not participate in the removal of pyruvic acid from the blood.

F. O. H.

Metabolism of α -ketoglutaric acid in animal tissues. H. A. KREBS and P. P. COHEN (Biochem. J., 1939, 33, 1895—1899).—In the presence of NH_4Cl sliced kidney cortex and minced heart muscle convert α -ketoglutaric into glutamic and succinic acids.

P. G. M.

Fate of oxalacetic acid in different organs. F. L. BREUSCH (Biochem. J., 1939, 33, 1757—1770).—Oxalacetic acid is quantitatively converted into pyruvic acid by spleen, lung, placenta, and peripheral nerves, and into a mixture of *l*-malic, pyruvic, lactic, and citric acids by kidney. The action of brain is mainly decarboxylation, and little of the pyruvic acid is reduced to lactic acid. Condensation of oxalacetic with pyruvic acid is effected by kidney and, to a smaller extent, by liver, brain, and lung, with formation of citric acid; muscle does not form citric acid. The enzyme which reduces oxalacetic to malic acid is prepared by extraction of pigeon muscle with PO_4''' buffer at 0° and pptn. with $(\text{NH}_4)_2\text{SO}_4$; the presence of a co-enzyme, *e.g.*, hexose mono- and di-phosphate, is necessary to the system, the optimum p_{H} of which is 8—8.5. The enzyme responsible for condensation of oxalacetic with glutamic acid can be extracted from tissues by aq. PO_4''' ; it is fractionally pptd. by 50—66%-saturation with $(\text{NH}_4)_2\text{SO}_4$. Spontaneous decarboxylation of oxalacetic acid is most rapid in acid solution. All tissues contain similar amounts of a thermostable substance which causes decarboxylation and may be an amine.

P. G. M.

Metabolism of two dideuterobutyric acids as indicated by deuterium content of excreted β -hydroxybutyric acid. M. MOREHOUSE (Proc. Soc. Exp. Biol. Med., 1939, 41, 595—596).—When ketonuric rats were fed on α -deuterobutyric acid only 4% of the excreted β -hydroxybutyric acid contained D. When the $\beta\gamma$ -acid was given, 17—25% of the excreted β -hydroxybutyric acid contained it. Thus D is retained in β -hydroxybutyrate when present on the γ -C but is lost when present on the α -C.

V. J. W.

Influence of diet on endogenous production of citric acid. A. H. SMITH and C. E. MEYER (J. Biol. Chem., 1939, 131, 45—55).—The white rat can synthesise citric acid from diets containing carbohydrate, fat, or protein. The ability of foods to give rise to citric acid is apparently independent of their acid- or base-producing rôle, but adequate diets containing most of their energy in the form of either carbohydrate or fat are more conducive to formation of endogenous citric acid than those composed chiefly of protein.

J. N. A.

Acetone fractionation of blood- and urinary iodine. R. A. DAVISON and G. M. CURTIS (Proc. Soc. Exp. Biol. Med., 1939, 41, 637—639).—All urine-I is acetone-sol. Blood-I is partly acetone-sol., partly acetone-insol. and water-sol., and partly

acetone- and water-insol. Proportions of these fractions vary with the different forms of I ingested.

V. J. W.

Influence of fats on calcium metabolism. I. B. VON EULER, H. VON EULER, M. MALMBERG, and B. LUNDBERG. **II.** B. VON EULER, H. VON EULER, and M. MALMBERG (Arkiv Kemi, Min., Geol., 1939, 13, A, No. 2, 20 pp., No. 9, 12 pp.; cf. A., 1939, III, 173).—The absorption, assimilation, and excretion of Ca by rats of all ages and both sexes have been studied. Growing rats and pregnant does showed the expected high Ca retention. Addition of vitamin-D to the diet increases absorption of Ca in the gut and also the % of absorbed Ca assimilated. Both absorption and excretion vary widely from day to day. Replacement of butter by margarine as sole source of fat has no effect on Ca metabolism; similarly, triolein and ethyl laurate are equally efficacious in rat rachitis.

M. H. M. A.

Application of radioactive isotopes to the study of biochemical exchanges and transformations. J. K. PARNAS (Bull. Soc. Chim. biol., 1939, 21, 1059—1093).—A lecture.

(xx) PHARMACOLOGY AND TOXICOLOGY.

Sulphanilamide derivatives. N¹N⁴-Diacyl- and N¹-acyl-sulphanilamides.—See A., 1939, II, 542.

Sulphanilamido-derivatives of heterocyclic amines [strepto- and pneumo-coccicides].—See A., 1939, II, 525.

Sulphanilamide and sulphapyridine in type III lobar pneumonia of rats. M. KEPL and F. D. GUNN (Proc. Soc. Exp. Biol. Med., 1939, 41, 457—459).—4 hr. after infection rats received by mouth 250 mg. of drug followed by 125 mg. daily for 6 days. No difference was found between the two drugs in preserving life but survival time was slightly longer under sulphapyridine.

V. J. W.

Sulphapyridine in experimental lobar pneumonia in dog. L. A. GREGG, C. G. LOOSLI, and M. HAMBURGER, jun. (Proc. Soc. Exp. Biol. Med., 1939, 41, 459—462).—After intrabronchial infection 50% of untreated dogs died. Others were given 2—3 g. of sulphapyridine, followed by 0.5 g. 3 times daily. Treatment began 3—24 hr. after infection. All recovered, but in those treated after 18—24 hr. bacteraemia was present.

V. J. W.

Pneumococcus (type III) meningitis with recovery [treated with sulphanilamide]. S. H. WELCH and H. F. MARTIN (J. Pediat., 1939, 15, 563—571).—146 c.c. of protosil and 270 grains of sulphanilamide were given over 4 months in a child aged 9 years.

C. J. C. B.

Mode of action of sulphapyridine on pneumococcus. R. D. REID (Proc. Soc. Exp. Biol. Med., 1939, 41, 437—442).—Mice were given 100 mg. of sulphapyridine by mouth and injected intraperitoneally with pneumococci. No histological changes could be seen in the capsules and no effect was pro-

duced on phagocytosis. *In vitro* the drug caused slowing of pneumococcal growth after 12—14 hr.

V. J. W.

Influence of disulphanilamide on experimental influenza infections. D. R. CLIMENKO, M. L. CROSSLEY, and E. H. NORTHEY (J. Pharm. Exp. Ther., 1939, 67, 201—211).—Mice infected with a virulent strain of human influenza virus were protected by subcutaneous or oral administration of Na disulphanilamide. The efficiency of the treatment was determined by the speed of its inauguration. The drug inactivated the virus *in vitro*.

E. M. S.

Inactivation of toxins *in vitro* by sulphanilamide. C. M. CARPENTER and G. M. BARBOUR (Proc. Soc. Exp. Biol. Med., 1939, 41, 354—357).—When one min. lethal dose of staphylococcal toxin was shaken up with an equal vol. of 1:1000 sulphanilamide before injection 97% of mice survived. Similar experiments with *C. welchii* toxin gave a survival rate of 84%.

V. J. W.

Effect of derivatives of benzenesulphonic acid on blood pressure and respiration. G. GENNARI (R. Ist. San. Pubbl., 1939, 2, 673—676).—The effect of benzenesulphonamide derivatives, administered by various routes to rabbits and dogs (normal and infected with *Streptococcus pyogenes*), was investigated; only doses above the normal therapeutic dose caused a transient hypertension and slight disturbance of respiratory rhythm.

F. O. H.

Acyl derivatives of sulphanilamide in presence of hydrogen chloride. A. MOSSINI (Boll. Soc. ital. Biol. sperim., 1939, 14, 387—389).—Rates of deacylation of the acetyl and oxalyl derivatives in 3% HCl indicate that, following oral administration, hydrolysis of these derivatives probably occurs in the stomach.

F. O. H.

Pharmacology of succinylsulphanilamide. L. LIACI (Arch. Farm. sperim., 1939, 68, 155—162).—Following oral administration to rabbits, the drug diffuses widely through the organism; highest concn. occurs in the bile.

F. O. H.

Sulphonamide preparations in treatment of biliary tract [infections]. L. LIACI (Boll. Soc. ital. Biol. sperim., 1939, 14, 463—464).—Oral administration of sulphanilamide or its succinyl derivative gives favourable results.

F. O. H.

Concentration of sulphanilamide in human bile. R. BETTMAN and E. SPIER (Proc. Soc. Exp. Biol. Med., 1939, 41, 463—464).—Patients with gallstones were given up to 135 grains of sulphanilamide. In most cases the concn. in the gall-bladder bile exceeded that in the blood.

V. J. W.

Mode of action of sulphanilamide. P. A. SHAFFER (Science, 1939, 89, 547—550).—Sulphanilamide and sulphapyridine are not themselves bactericidal and their therapeutic and toxic effects are due to oxidation products of these substances formed by atm. O₂ under the catalytic influence of respiring tissues.

W. F. F.

Mode of action of sulphanilamide. A. LOCKE and R. R. MELLON (Science, 1939, 90, 231—232).—A criticism of the views of Shaffer (see above).

p-Hydroxylamino- and *p*-nitroso-benzenesulphonamide are obtainable by biologically feasible oxidations, but are produced stepwise and not simultaneously. W. F. F.

Formation of peroxide and a reversible oxidation-reduction in solutions of sulphanilamide. G. BARKAN (Proc. Soc. Exp. Biol. Med., 1939, 41, 535—537).—0.25% solutions of sulphanilamide in presence of O₂ produce H₂O₂ which can be detected by conversion of phenolphthalin into phenolphthalein in presence of CuSO₄, causing a red colour. This changes in some hr. to violet, the red being restored by Na₂S₂O₄. Shaking with air changes it back to violet. V. J. W.

Sulphanilamide therapy of lung abscess. F. A. HUI (Chinese Med. J., 1939, 56, 153—154).—Complete remission was produced by sulphanilamide in a case of lung abscess due to hæmolytic streptococcus. The amount used was 0.5 g. by mouth 4-hourly for 4 days, 8-hourly for 5 days, and 4-hourly for a further 5 days. W. J. G.

Pneumococcus empyema treated by local irrigation with sulphonamide. T. L. KUO (Chinese Med. J., 1939, 56, 155—156).—An empyema following pneumonia in a year-old boy was successfully treated by irrigation with 1/1000 sulphonamide in normal saline. W. J. G.

Sulphanilamide in experimental tuberculosis. M. M. STEINBACH and B. M. DILLON (Proc. Soc. Exp. Biol. Med., 1939, 41, 613—616).—Oral administration of 300 mg. daily to guinea-pigs had no effect on the course of experimental tuberculosis. V. J. W.

Effect of sulphanilamide on diphtheria bacilli. A. ROSA (Boll. Soc. ital. Biol. sperim., 1939, 14, 382—384).—The drug in concns. down to 0.01% has an inhibitory effect on the *in-vitro* growth of Löffler's bacillus. F. O. H.

Sulphanilamide in subacute bacterial endocarditis. W. W. SPINK and F. H. CRAGO (Arch. intern. Med., 1939, 64, 228—248).—Sulphanilamide was given to 12 cases of subacute bacterial endocarditis (11 *Str. viridans*, 1 *Staph. albus*). The blood stream became temporarily sterile in 6 cases and the temp. was sometimes lowered. Only 2 cases were definitely improved and one of these died subsequently, the other remaining well for 9 months. In all the other cases the drug did not modify the fatal course of the disease. C. A. K.

Treatment of brucellosis [with M. and B. 693]. H. SCHOLER (Schweiz. med. Wschr., 1939, 69, 685—686).—A patient suffering from *Brucella abortus*, Bang, was cured by daganan (M. & B. 693). A. S.

Sulphanilamide in gonorrhœa. F. E. GRIMALDI and A. A. GRIMALDI (Rev. Med., Buenos Aires, 1939, 1, 50—52).—A report of 250 cases with 80% of cures within 10 days. In most cases the symptoms disappeared in 48 hr. S. O.

Recent advances in treatment of syphilis and gonorrhœa in women. W. SCHELLENBERG (Mschr. Geburtsh. Gynäk., 1939, 109, 113—136).—A review. (B.) A. S.

Sulphapyridine in influenzal meningitis. T. R. HAMILTON and F. C. NEFF (J. Amer. Med. Assoc., 1939, 113, 1123—1125).—A case of influenzal meningitis with bacteræmia was successfully treated with sulphapyridine. C. A. K.

Bacterium necrophorum in chronic ulcerative colitis and effect of sulphanilamide in treatment. G. M. DACK, J. B. KIRSNER, L. R. DRAGSTEDT, and R. JOHNSON (Amer. J. digest. Dis., 1939, 6, 305—308).—*B. necrophorum* was not found in cultures from the normal colon of 99 patients, but was found in 7 of 28 cases of diseases of the colon other than chronic ulcerative colitis. It was isolated from 27 of 38 patients in various stages of chronic ulcerative colitis, 10 of whom were treated in the acute stage of the disease with sulphanilamide. Sulphanilamide did not hasten healing markedly, although mild to moderately severe cases showed slight improvement temporarily. There is a tendency for exacerbation of symptoms on withdrawal of the drug. *B. necrophorum* did not disappear from the diseased colon of patients taking this drug although, after healing occurs, it is usually absent. C. J. C. B.

Effect of administration of an acetate on detoxication and therapeutic activity of sulphanilamide. G. V. JAMES (Biochem. J., 1939, 33, 1688—1693).—Oral administration of Na acetate + sulphanilamide to mice increases excretion of acetyl-sulphanilamide, and diminishes the toxic effect of the drug without affecting its therapeutic val. This effect does not occur with repeated small doses of sulphanilamide. P. G. M.

Toxic manifestations after oral administration of sodium sulphapyridine. H. MOLITOR and H. ROBINSON (Proc. Soc. Exp. Biol. Med., 1939, 41, 409—410).—0.25—0.5 g. per kg. in 10% solution caused in monkeys gastric irritation and renal calculi. Similar results occurred in rats and rabbits. V. J. W.

Chronic effect of sulphanilamide in dogs and monkeys with particular reference to blood. S. Y. P'AN (Chinese Med. J., 1939, 56, 111—121).—Sulphanilamide in varying doses over a period of 3 months produced anæmia in all the monkeys and dogs studied. Of 4 dogs, 2 developed leucopenia and 1 granulocytopenia. Transient spastic motor paralysis of the hind limbs was associated with impaired liver function in 1 dog. W. J. G.

Effects of sulphanilamide on the lower vertebrates. J. T. LITCHFIELD, jun. (J. Pharm. Exp. Ther., 1939, 67, 212—223).—Sulphanilamide caused muscular disturbances in fish, frog, and chicken. The toxic effect was reproduced on isolated frog's muscle. Cyanosis developed in the chicken only. Fish was most susceptible, frog least. Conjugated derivatives were found in the blood of fish and chicken. Excretion was slow in all. E. M. S.

Rabbit serum in pneumococcal pneumonia. W. B. WOOD (J. Amer. Med. Assoc., 1939, 113, 745—749).—Conc. antipneumococcus rabbit serum was given to 50 patients with pneumococcal pneumonia. Of 8 patients with type III pneumonia 4 died. The fatality rate was 14.3% in the remaining cases of

various types. Thermal reactions occurred in 26% and serum sickness in 36% of cases. C. A. K.

Active ingredients of garlic. E. GLASER and R. DROBNIK (Arch. exp. Path. Pharm., 1939, 193, 1—9).—Garlic has some oestrogenic, bacteriostatic, and enzymic (catalase) activity. H. O. S.

Efficiency of several germicides and antiseptics on the oral mucosa. E. MEYER and L. ARNOLD (Amer. J. digest. Dis., 1938, 5, 418—420).—Of many antiseptics used, tincture of metaphen was the most effective agent both in its germicidal action on the oral mucous membrane and in the duration of antiseptic action. The tincture is convenient because there is little irritation, the colour marks the area treated, and it is very readily washed off with water. C. J. C. B.

Pectin and nickel pectinate in acute and chronic bacillary dysentery. L. H. BLOCK, A. TARNOWSKI, and B. H. GREEN (Amer. J. digest. Dis., 1939, 6, 96—103).—Pure pectin was ineffective; Ni pectinate possessed detoxifying, bactericidal, and anti-hæmorrhagic properties and was effective in the treatment of bacillary dysentery. The results in most of 95 cases treated with Ni pectinate for varied periods of time were excellent. C. J. C. B.

Bactericidal action of pectin and metal pectinates. L. ARNOLD (Amer. J. digest. Dis., 1939, 6, 104—105).—Pectin does not possess bactericidal power. Metal pectinates exert bactericidal action, Ag pectinate especially. C. J. C. B.

Antibacterial action of *Folia urvi* in urine. G. MADAUS and F. E. KOCH (Z. ges. exp. Med., 1939, 105, 679—692).—Arbutin degradation products (quinol, benzoquinone, and quinhydrone) have a strong antibacterial action in water on *B. coli*; they act in urine only in 100 times greater concn. The bactericidal action in urine is weaker because of the presence of reducing substances. Quinol has an bactericidal action only in alkaline urine. A. S.

Disinfectants. H. HORNING (Münc. med. Wschr., 1939, 86, 1230—1233).—Zephirol and quartamon (1% solution; 3—5 min.) are recommended as hand disinfectants. A suspension of *B. coli* (0.5 c.c. in 5 c.c.) stopped growing on the 2nd day after addition of zephirol and quartamon; growth continued for 8 days after addition of nipasol, nipagin, or phenol. Cresol-soap solution, baktol, sagrotan, and valvanol are recommended as laundry disinfectants. A. S.

Comparative effectiveness of two antiseptics in preventing infection following delivery. J. E. TRITSCH (Amer. J. Obstet. Gynec., 1939, 37, 277—281).—From 500 cases treated with a new antiseptic "amphyl" (a sol. concentrate of synthetic alkyl and halogen phenol derivatives) and 500 cases treated with mercurochrome it is concluded that these two antiseptics are equally effective in the prevention of puerperal infection. M. H.

Action of detoxin in prophylaxis of puerperal sepsis. H. RAU (Med. Klin., 1939, 35, 1015—1016).—Intravenous and intramuscular injections of de-

toxine were successfully used as prophylactic against puerperal septicaemia. A. S.

Iodocholeate: a new fungicidal preparation. W. F. LEVER (Arch. Dermatol. Syphilol., 1939, 40, 19—28).—The I in iodocholeate, being adsorbed to the bile salt, is less volatile and combines less readily with protein. It is therefore less irritating and has greater fungicidal power than tincture of I in the presence of protein. C. J. C. B.

Synthetic tar paste. W. H. GUY, F. M. JACOB, and F. WEBER (Arch. Dermatol. Syphilol., 1939, 40, 90—91).—The formula for such a paste is given. C. J. C. B.

[Pyrethrum for killing] insects in aircraft. F. P. MACKIE (Nature, 1939, 144, 250—251).—Aq. base pyrethrum insecticide is effective in killing mosquitoes and other insects in aircraft. W. F. F.

Dipterous larvæ and wound treatment. A. D. IMMS (Nature, 1939, 144, 516—517).—A review. W. F. F.

Effect of mixed solutions of atropine and pilocarpine on the pupil. B. ATZORI (Arch. Farm. sperim., 1939, 68, 134—140).—With increasing concn. of added atropine (up to 7 times the concn. of pilocarpine), myosis (rabbit) due to pilocarpine is reduced and finally abolished; conversely, mydriasis due to atropine is reduced and finally abolished by increasing concn. (up to 25 times the concn. of atropine) of added pilocarpine. F. O. H.

Effect of non-alkaloidal anti-spasmodics on plain and leech muscle and comparison with that of atropine and papaverine. I. Excised rabbit's intestine. T. YOSHIDA (Folia pharmacol. japon., 1939, 27, 16—17).—Octinum (A., 1937, III, 134) in small doses causes contraction due to muscular stimulation, although in some cases a sympathomimetic action is shown. Large doses cause relaxation of muscle. Benzyloctinum has a paralysing, and small doses a sympathomimetic, action. Medium doses of trasentin (A., 1938, III, 429) or its benzyl derivative have a paralysing effect on the peripheral sympathetic system as well as on muscle. The anti-spasmodic effect of the above drugs is compared with that of atropine and papaverine. J. N. A.

Effect of sympamine (β -phenylisopropylamine) on arterial pressure, respiration, and splenic contraction. L. CIOLIA and G. FRADÀ (Boll. Soc. ital. Biol. sperim., 1939, 14, 413—414).—In chloralosed dogs, the drug increases arterial blood pressure (due to peripheral vasoconstriction and cardiac disturbance) and frequency and amplitude of respiration and decreases splenic vol. F. O. H.

Site of action of ergometrine. I. Antagonism to adrenaline. R. SANTI (Boll. Soc. ital. Biol. sperim., 1939, 14, 459—461).—The effects of ergometrine and adrenaline on guinea-pig's isolated intestine and pregnant and non-pregnant uterus indicate that the two substances have different mechanisms of action. Ergometrine, which acts on sympathetic nerve endings, has an action different from that of ergotamine. F. O. H.

Effect of gardenal on autonomic nervous system. L. DONATELLI (Boll. Soc. ital. Biol. sperim., 1939, 14, 496—498).—In rabbits, gardenal depresses the vagal parasympathetic and inhibits the effects of peripheral vagal stimulation; large doses inhibit, whilst small doses do not affect, the response to pilocarpine. The hypertensive action of adrenaline is enhanced. F. O. H.

Pharmacology of urinary bladder. L. DONATELLI (Boll. Soc. ital. Biol. sperim., 1939, 14, 498—500).—The pharmacological actions of adrenaline, sympathol, ephedrine, and sympamine on the bladder (rabbit) are described. F. O. H.

Pigeon method of assay of *Digitalis lutea*. A. BORIANI (Boll. Soc. ital. Biol. sperim., 1939, 14, 380—382).—The method indicates that *D. lutea* often attains a pharmacological activity greater than that of *D. purpurea*. F. O. H.

Calcium and digitalis synergism. P. K. SMITH, A. W. WINKLER, and H. E. HOFF (Arch. intern. Med., 1939, 64, 322—329).—CaCl₂, given intravenously to digitalised dogs, was no more toxic than in normal dogs. There was no evidence of synergistic or even completely additive effects. Changes in the e.c.g. were correlated with serum-Ca levels. C. A. K.

Quinidine and strychnine in auricular fibrillation. H. L. SMITH and E. W. BOLAND (J. Amer. Med. Assoc., 1939, 113, 1017—1022).—The use of quinidine and strychnine in 41 cases of auricular fibrillation is described. C. A. K.

Effect of quinidine on auricular fibrillation. J. C. ETCHEVÉS (Rev. Med., Buenos Aires, 1939, 1, 62—64).—Report of one case in which normal rhythm was established after oral administration of 0.6 g. of quinidine sulphate. Fibrillation reappeared after 24 hr. and disappeared for a similar period after giving a fresh dose of the drug. This was observed several times. S. O.

Effect of cardiac drugs on mother and foetus. W. INGIULLA (Boll. Soc. ital. Biol. sperim., 1939, 14, 425—427).—Quinine, adrenaline, veritol, and strophanthin permeate the placenta (dog) and produce varying effects in the foetus. Quinine depresses foetal cardiac movement and blood pressure but only slightly affects those of the mother, whilst the maternal hypertension and increased contraction of the heart due to adrenaline are only slightly evident in the foetus. Strophanthin has a similar effect in foetus and mother. Other cardiac drugs tested are without effect. F. O. H.

Antidotal effect of ascorbic acid to digitalis glucosides. I, II. T. GALLI, D. BUSSA, and G. MONTOLIVO (Boll. Soc. ital. Biol. sperim., 1939, 14, 547—548, 548—549).—The toxicity of digilanid, digitalin, and strophanthin (the last two also in presence of Ba), subcutaneously injected into guinea-pigs, is reduced by simultaneous injection of ascorbic acid. The effect is greatest with small doses of the glucosides. F. O. H.

Effect of strophanthin on blood vessels and cardiac output. K. H. OSTERWALD and H. MEURER (Z. Kreislaufforsch., 1939, 31, 522—532).—Thermo-

stromuhr experiments showed that either peripheral or splanchnic vessels contract primarily on therapeutic doses of strophanthin in dogs under morphia-pernoctan anaesthesia, and this contributes to the lowering of the cardiac output. The longer-lasting decrease of cardiac output is due to the throttling of hepatic circulation. G. SCH.

Different effects of ephylline and deryphylline. K. H. OSTERWALD and H. MEURER (Z. Kreislaufforsch., 1939, 31, 593—603).—The different effects of ephylline and deryphylline are due to the solvents of theophylline used, ethylenediamine and diethanolamine, the former decreasing blood pressure, coronary flow, and heart rate (thermostromuhr experiments), the latter having no adverse effects. G. SCH.

Pharmacological determination of cardio-kinetic substances in avitaminotic and hyper-avitaminotic pigeons. V. ERSPAMER (Arch. Farm. sperim., 1939, 68, 151—154).—The min. intravenous emetic dose of ouabain in normal pigeons is unchanged by incidence of avitaminosis- or hyper-avitaminosis-B₁. Biological determination of, and pharmacological reactions to, digitalis glucosides are also unaffected. F. O. H.

Alkyl nitrites. III. Pharmacologic study of a new series of organic nitrates. IV. Pharmacology of isomannide dinitrate. J. C. KRANTZ, jun., C. J. CARR, S. FORMAN, and F. W. ELLIS (J. Pharm. Exp. Ther., 1939, 67, 187—190, 191—200; cf. A., 1939, III, 85).—III. The effect of isomannide, isosorbide, and erythritan dinitrates, and styrcitol, polygalitol, mannitan, and sorbitan tetranitrates on the blood pressure of anaesthetised dogs was determined. The presence of the ether linkage in the mol. of the nitrates of the sugar alcohols diminished potency but prolonged duration of the depressor response.

IV. The duration of the depressor action of isomannide dinitrate is longer than that of erythrol tetranitrate in dogs and man. It dilates coronary vessels in various species. No methaemoglobin is produced in dog's blood *in vivo* or *in vitro*. After oral administration (0.1 g.), the blood pressure in normal man fell within 10 min. (max. fall 20%), recovering within 5—6 hr. E. M. S.

Physiological adaptations in cardiac slowing by digitalis and their bearing on problems of digitalisation in patients with auricular fibrillation. H. GOLD, N. T. KWIT, H. OTTO, and T. FOX (J. Pharm. Exp. Ther., 1939, 67, 224—238; cf. A., 1939, III, 861).—In digitalised patients with auricular fibrillation the ventricle is maintained at a slow rate by the summation of a vagal factor (abolished by atropine) and an extravagal factor. Control of the rate may pass from the vagal to the extravagal factor as the dose is increased without change in the ventricular rate. Increased vagal tone in one stage of digitalis action, and decreased vagal tone after more intensive digitalisation, are the results of reflex adjustments. E. M. S.

Effect of fluid extract of ergot and of ergotamine on the emptying time of the human stomach. E. J. VAN LIERE and C. K. SLEETH (J. Pharm. Exp. Ther., 1939, 67, 250—255; cf. Physiol. Abs., 1937,

22, 926).—Fluid extract (2 c.c.) caused 30%, and ergotamine (1 mg.) 16%, delay in emptying time, attributed to relaxation of the smooth muscle of the stomach. E. M. S.

Phenolphthalein [as laxative]. H. W. SOPER (Amer. J. digest. Dis., 1938, 5, 297).—Over 15% of 177 patients in a gastro-enterologic clinic employed phenolphthalein as a habitual laxative. In 85% a diagnosis of catarrhal colitis was made. The rest had established a tolerance for the drug and exhibited no signs of toxicity. Chronic stomatitis was present in 3 patients addicted to the drug. C. J. C. B.

Karaya gum as a mechanical laxative. A. C. IVY and B. L. ISAACS (Amer. J. digest. Dis., 1938, 5, 315—321).—Karaya, in its unprocessed form, as well as in its processed form, mucara, causes in dogs increased frequency of defæcations, increased bulk and moisture, and does not cause detectable irritation. Similar results were found in most men. C. J. C. B.

Calcium gluconate and kaolin in treatment of bacillary dysentery. B. L. GREENE and L. H. BLOCH (Amer. J. digest. Dis., 1938, 5, 684—687).—In 60 cases of bacillary dysentery the combined Ca and kaolin method of treatment described reduced the mortality 50—75% depending on severity of infection. Best results were obtained with intravenous or intramuscular injections of Ca gluconate supplemented by oral dosage with Ca gluconate and kaolin. C. J. C. B.

Clinical study of diphenylacetyl-diethylamino-ethanol (trasentin) as anti-spasmodic. E. SPIER, F. NEUWELT, and H. NECHELES (Amer. J. digest. Dis., 1939, 6, 387—389).—Trasentin was studied in 32 patients; it proved valuable as an antispasmodic in cases of duodenal and marginal ulcer, gastritis, cholelithiasis, biliary dyskinesia, and spastic colon in which usual therapy was of little help. In 5 patients it stopped postoperative diarrhoea which was refractory to usual medication except paregoric. C. J. C. B.

Pharmacodynamic action of octyl derivatives. I. Effect on isolated guinea-pig's intestine. F. CAVALLI (Boll. Soc. ital. Biol. sperim., 1939, 14, 550—552).—The effect of octyl alcohol, bromide, and thiocyanate, dioctyl ether, octylamine, diethyloctylamine, sec.-octylamine, and Δ^2 -6-methylamino-2-methylheptene was determined. The amines (as hydrochlorides) increased the amplitude of contraction. F. O. H.

Constipation and drugs of opium series. N. ALWALL (Acta med. scand., 1939, 101, 419—432).—In a series of normal healthy male students, therapeutic doses of pantopon and tincture of opium caused retention of faeces in 50% of cases and hard stools in the others. For morphine the figure was 20% for retention, with 70% hard stools. Doubling the dose raised the retention figure to 70% for pantopon and opium, and 50% for morphine. The effect lasted 1—1½ days. C. A. A.

Anthelmintics. ANON. (J. Amer. Med. Assoc., 1939, 113, 410—415).—A discussion. C. A. K.

Action of different types of pepper on urinary tract. M. RAUNERT (Z. ges. exp. Med., 1939, 105, 736—742).—Various types of pepper increase diuresis. A. S.

Effect of diuretic mercurial preparations on elimination of uric acid. A. FERRANNINI and G. FONTANA (Boll. Soc. ital. Biol. sperim., 1939, 14, 557—558).—Urinary excretion of uric acid is increased in men (normal or suffering from hepatic disease). F. O. H.

Advantageous use of codeine-free analgesics. C. KÜHN (Med. Welt, 1939, 13, 1163—1164).—Coffetyl (0.45 g. of acetylsalicylic acid + 0.05 g. of caffeine) was successfully used as analgesic in various conditions. A. S.

Morphine, codeine, and their derivatives. XV. 2:4-Dinitrophenylmorphine. N. B. EDDY and M. SUMWALT (J. Pharm. Exp. Ther., 1939, 67, 127—141; cf. A., 1939, III, 778).—Dinitrophenylmorphine is a more potent respiratory depressant than morphine or codeine. It has less analgesic action than morphine, more than codeine. It has no dinitrophenol-like effect. E. M. S.

Addiction characteristics of (a) dihydro-morphine ("paramorphan"), (b) dihydrodeoxymorphine-D ("desomorphine"), (c) dihydrodeoxycodine-D ("desocodeine"), and (d) methyl-dihydromorphinone ("metopon"). C. K. HIMMELSBACH (J. Pharm. Exp. Ther., 1939, 67, 239—249).—Each compound was substituted for morphine in groups of addicted patients. Addiction satisfaction by (a), (b), and (c) was nearly complete, by (d) incomplete. The relative intensity and duration of their physical dependence effect varied considerably. E. M. S.

Treatment of barbiturate poisoning. L. ZANCAN (Boll. Soc. ital. Biol. sperim., 1939, 14, 490—493).—Massive injection of physiological saline containing camphor, strychnine, coramine, or sympamine, antagonises the action of Na veronal in rabbits. F. O. H.

General anaesthesia by chilling. G. H. PARKER (Science, 1939, 90, 63).—Fishes, amphibians, and reptiles may be fully anaesthetised by immersion in a mixture of ice and water for 10—15 min. The anaesthetic is suitable for an extended operation if the animal is laid out on ice. W. F. F.

Electrical anaesthesia in rats. M. L. SILVER (Proc. Soc. Exp. Biol. Med., 1939, 41, 650—651).—D.c. of 10 ma. applied to a rat by Zn-ZnSO₄ electrodes, cathode on the palate and anode in the rectum, causes complete anaesthesia as long as current flow continues. Recovery is complete in 10 min. and no undesirable effects were noted. V. J. W.

Mechanism of the depression of serum-potassium by anaesthetics. P. S. LARSON and G. BREWER (J. Pharm. Exp. Ther., 1939, 67, 147—152).—The fall in serum-K, which occurred constantly in dogs under morphine, ether, and Na pentobarbital, was not related to changes in blood-sugar levels. Administration of dinitrophenol prevented the fall under Na pentobarbital. Depression of serum-K

by anaesthetics is a result of lowered metabolic rate. E. M. S.

Effect of anaesthetics on blood. P. W. SEARLES (J. Amer. Med. Assoc., 1939, 113, 906—909)—Ether anaesthesia in dogs caused an increase in cell vol., hæmoglobin content, erythrocyte count, and blood platelets. These effects were halved after splenectomy. Na amytal caused a decrease in cell vol., hæmoglobin content, and erythrocyte count, effects which were completely abolished by splenectomy.

C. A. K.

Toxicity of solutions used for producing local anaesthesia. J. O. OLIVER (Brit. Dental J., 1939, 66, 220—222).—In mouse tests "cobefrin" (3:4-dihydroxyphenylpropanolamine) was less toxic than adrenaline when used as vasoconstrictor in conjunction with procaine. A. G. P.

Antagonism of tetraethylammonium camphor-sulphonate towards the effects of chloral hydrate and ethyl urethane on isolated toad's heart. M. CORAZZA (Arch. Farm. speriment., 1939, 68, 141—150).—The camphorsulphonate (which excites the heart) inhibits the depressive effect of chloral hydrate or ethyl urethane. F. O. H.

Pharmacology of diethylaminoethyl diphenylacetate-phenylethylbarbiturate. F. CAVALLI (Boll. Soc. ital. Biol. speriment., 1939, 14, 552—553).—The drug ("neurotrasentin") stimulates the spinal cord, the autonomic nervous system, and smooth muscle and has a toxicity intermediate between those of the two compounds and only slight cumulative action. F. O. H.

Death following benzedrine sulphate. L. C. SMITH (J. Amer. Med. Assoc., 1939, 113, 1022—1023).—A case report. C. A. K.

Quantitative comparison of different analeptics. M. CHAKRAVARTI (J. Pharm. Exp. Ther., 1939, 67, 153—174).—Picrotoxin, strychnine, ephedrine, benzedrine, cardiazol, and coramine were compared. In relation to toxicity benzedrine had the greatest awakening power in mice under nembutal narcosis. Picrotoxin and cardiazol alone antagonised lethal doses of nembutal. Benzedrine and ephedrine were superior to the others as respiratory stimulants. In cats and rabbits analeptics augmented the carotid sinus reflex (previously depressed by a narcotic) only when given in enormous doses. E. M. S.

Present status of picrotoxin in poisoning by barbiturates. COUNCIL ON PHARMACY AND CHEMISTRY (J. Amer. Med. Assoc., 1939, 112, 431—433). R. L. N.

Fate of the injected oxytocic principle of posterior pituitary in anaesthetised cats and dogs. E. LARSON (J. Pharm. Exp. Ther., 1939, 67, 175—186; cf. A., 1938, III, 484).—Less than 30% was eliminated in the urine, mostly within 15 min. The effect of various tissue and other enzyme preps. on the oxytocic activity of posterior pituitary extract was assayed. The oxytocic principle is inactivated by polypeptidases present in tissues. E. M. S.

Toxicological experiments on manganese. A. C. LEMOS (J. Pharm. Chim., [viii], 30, 206—213).—Sol. Mn compounds ($MnCl_2$, $MnSO_4$, $KMnO_4$)

were given by oesophageal tube, mixed with the diet, and intramuscularly. MnO_2 was mixed with the diet, or injected in oily suspension, or inhaled. $MnCl_2$ given orally killed the animals and was recovered (cf. Chéramy and Lemos, A., 1937, III, 82) principally from the heart, kidneys, and liver. The adrenals, bone marrow, bile, and skin had increased Mn contents. $MnSO_4$ caused moderate increases in the Mn content of all organs. Intramuscular injection led to a marked deposition of Mn in the adrenals, bone marrow, and spleen. Inhalation of MnO_2 led to a raised Mn content of many organs, particularly the brain, and more so the longer was the exposure to the particles. J. L. D.

Pharmacology of strontium. V. Direct effect on bulbar and cortical centres. A. BORIANI (Arch. Farm. speriment., 1939, 68, 105—122; cf. A., 1939, III, 934).—Direct injection of dil. aq. Sr salt into the bulbar centres (dog, rabbit) stimulates respiratory and vasomotor centres; conc. solutions have a depressive effect. Direct or intravenous administration of Sr^{++} diminishes electrical excitability of motor cortex. F. O. H.

Behaviour of metallic powders in body. I. Histological research and determination of copper, cobalt, and nickel in organs. II. Excretion and effect on white-cell count of copper, cobalt, and nickel. III. Histological research and effects on white-cell count of silver, aluminium, and zinc. A. CANNAVÀ (Arch. Sci. biol., Napoli, 1939, 25, 309—340, 341—359, 360—371).—I. Suspensions of finely powdered Cu, Co, and Ni in a solution of glucose were injected intravenously into rabbits. Co (2—3 mg. per kg.) and Ni (4—5 mg. per kg.) were well tolerated, whereas Cu (2—3 mg. per kg.) produced pulmonary lesions and death at higher doses. 24 hr. after the injection most Co and Ni are found in the lungs and a small part in the liver; Cu is found in the two organs. After longer periods no metals, or only traces, are found in the organs.

II. 53% of the Co, 40% of the Ni, and 12% of the Cu are excreted in urine; the excretion is max. on the 1st day and completed in about 4 days. In the faeces 15% of the Co, 47% of the Ni, and 55% of the Cu are excreted. All the three metals (but mainly Co and Ni) produce leucocytosis, mostly by increase of the neutrophilic cells.

III. Intravenous injection into rabbits of finely powdered suspensions of Ag and Zn (2—10 mg. per kg.) are well tolerated but similar doses of Al cause death by pulmonary embolism. The histo-pathological alterations produced are described. All the three metals produce granulocytosis but only Ag increases slightly the total white-cell count. S. O.

Tryparsamide in the control of African sleeping sickness. L. PEARCE (Science, 1939, 90, 39—40).—A survey. W. F. F.

Nitritoid reactions due to tryparsamide. F. A. ELLIS (Arch. Dermatol. Syphilol., 1939, 40, 707—708).—A case of severe nitritoid reaction due to tryparsamide is reported. C. J. C. B.

Effect of various diets on the resistance of *Mus musculus* to arsenobenzene poisoning.

G. GENNARI (R. Ist. San. Pubbl., 1939, 2, 503—512).—The % mortality of mice is decreased by addition of raw liver to the diet. The lowest mortality is obtained with a complete and balanced diet.

F. O. H.

Intravenous drip chemotherapy of syphilis. H. T. HYMAN, L. CHARGIN, J. L. RICE, and W. LEIFER (J. Amer. Med. Assoc., 1939, 113, 1208—1215).—Neoarsphenamine was successfully used by intravenous drip in the treatment of early syphilis. Toxic effects were fairly frequent but there was only one fatality, from hæmorrhagic encephalitis.

C. A. K.

Occurrence of arsenic in brain after administration of *p*-hydroxy-*m*-acetamidophenylarsinic acid. C. TOMITA and T. HOJÔ (Folia pharmacol. japon., 1939, 27, 15—16).—After gastric administration to rabbits of a 4% solution of the substance in N-NaOH, As is detected in the brain tissue only in a few cases whilst after intravenous injection (ear) it is always present, the max. amount occurring after 12 hr.

J. N. A.

Influence of artichoke extract on the antitoxic function of the liver in guinea-pigs. O. GAUDIN (Bull. Sci. Pharmacol., 1939, 46, 167—178).—Peroral administration of artichoke juice prevents or minimises hepatic lesions due to Na cacodylate injection.

R. T.

Inhibiting effect of quinquevalent arsenicals on *Trichomonas*. A. E. RAKOFF (Amer. J. Obstet. Gynec., 1939, 37, 265—272).—A comparison of the chemotherapeutic efficacy of aldarson, acetarson, and carbarsone in the treatment of *Trichomonas* infestations was made, based on their relative inhibiting effects on trichomonads *in vitro* and their relative toxicity for rats. It was concluded that of the three drugs, aldarson has by far the highest chemotherapeutic index whilst carbarsone is somewhat more effective than acetarson.

M. H.

Experimental study of rectal administration of mercurial diuretics. I. J. BRIGHTMAN and R. A. LEHMAN (J. Lab. clin. Med., 1939, 25, 56—66).—A comparison has been made of the local toxicity, absorption, and elimination of various suppositories, and the lesions which they may produce in the colon of the cat are described. A distinct correlation exists between the p_H of the drug in the suppository and its toxicity, preps. of low p_H causing fewer reactions. So far as local irritation is concerned, the chemical combination of theophylline with salyrgan or the admixture of salyrganic acid with salyrgan, or both, appears only to serve the purpose of reducing the p_H of an aq. solution of the suppository ingredients. Absorption of mercurial diuretics, as studied by determining the Hg content of the large intestine of the cat 24 hr. after introduction of a suppository, is highly irregular, and no correlation with local toxicity, p_H , or chemical composition is apparent. The excretion of Hg diuretics, as studied by the Hg content of the urine collected during the first 24 hr. after administration of a suppository, is also highly irregular.

C. J. C. B.

Changes in blood vessels after mercury poisoning. K. FELLINGER and F. SCHWEITZER (Arch. Gewerbepath. Gewerbehyg., 1938, 9, 269—275).—Clinical observations are described.

M. A. B.

Detection of gold in fæces. M. J. SCHULTE (Pharm. Weekblad, 1939, 76, 1257—1258).—A patient showed signs of poisoning after 12 injections of 100 mg. of sanocrysine (436 mg. of Au). Au was detected in the fæces as Tl aurichloride after extracting the ash successively with HCl and aqua regia.

S. C.

Action of sodium thiosulphate on mineral metabolism and blood-lead level in lead poisoning. F. SCHMITT and H. LOSSIE (Dtsch. Arch. klin. Med., 1939, 184, 405—432).—Good results in patients suffering from Pb poisoning were obtained with intravenous injections of $Na_2S_2O_3$. Blood-Pb is diminished, the Cl content of red cells rises, and urinary Pb excretion is increased. An increase in blood-Pb was found in patients suffering from nephritis, cardiac failure, liver diseases, and malignant growths.

A. S.

Pharmacology of monosodium phosphate. S. GAJATTO (Arch. Farm. sperim., 1939, 68, 87—98).—Aq. NaH_2PO_4 , intravenously injected into rabbits, produces death (min. lethal dose 1.4828 g. per kg.) due to toxic acidosis and attended by convulsions and respiratory and cardiac failure. The toxicity of NaH_2PO_4 , which is less than one third that of Na_2HPO_4 (when expressed as g.-equivs.), is not antidoted by $CaCl_2$.

F. O. H.

Nicotinic acid and the vitamin-B complex in insulin tolerance. J. C. BURKE and A. R. MCINTYRE (J. Pharm. Exp. Ther., 1939, 67, 142—146; cf. A., 1939, III, 286).—Nicotinic acid decreased the duration of augmented insulin hyperglycæmia, induced in rats by the addition of thiamin to a basal diet. A similar decrease was produced with a lipid material obtained from rice polishings, but cryst. vitamin- B_6 was without effect.

E. M. S.

Effect of sodium bromide on nutrition and gastro-intestinal tract of epileptic patients. A. J. ARIEFF (J. Lab. clin. Med., 1939, 25, 19—24).—Bromides are secreted by the stomach, displacing the Cl ions. HBr *in vitro* retards peptic digestion but not enough to produce clinical symptoms. Bromides have no retarding effect on tryptic digestion *in vitro*. High blood-Br' has no effect on nutrition. Wt. loss is produced only when there is anorexia or Br' toxicosis producing an inadequate caloric intake. Gastric analyses of patients on bromides showed nothing significant. The Cl ion was displaced by Br by 25—50%. A high blood-Br' level produced no abnormal change in the basal metabolic rate.

C. J. C. B.

Bromide intoxication. L. P. GUNDRY (J. Amer. Med. Assoc., 1939, 113, 466—470).—Bromide intoxication was studied in 15 cases. Symptoms of bromism occur when the blood-Br' level exceeds 150 mg.-%.

C. A. K.

Thiocyanate dermatitis. M. E. GREEN and J. S. SNOW (Arch. intern. Med., 1939, 64, 579—585).—A severe urticarial eruption occurred in a case of hypertension treated with KCNS.

C. A. K.

Quinine dermatitis from "anacin." J. H. LAMB (Arch. Dermatol. Syphilol., 1939, 40, 803—804).—2 cases are reported in which it is proved that the small amount (1 grain) of quinine in anacin tablets was the cause. C. J. C. B.

Toxicity of indene. G. R. CAMERON and C. R. DONIGER (J. Path. Bact., 1939, 49, 529—533).—Indene exerts toxic effects on rats, mice, and guinea-pigs, producing liver necrosis, sometimes of the cytolytic type (acute yellow atrophy), less frequently splenic and renal focal necrosis. Other organs are unaffected. No significant change has been found in the blood picture. Young rats are much more susceptible than fully grown animals. Since toxic effects are obtained only after exposure to high concns. or the administration of large amounts, indene cannot be regarded as highly noxious. However, a limit should be set to the indene content of such insecticides as heavy coal-tar naphtha. (4 photomicrographs.)

C. J. C. B.

Effect of camphor and menthol on *in-vitro* culture of fibroblasts. T. TANAKA (Folia pharmacol. japon., 1939, 27, 14—15).—Camphor and menthol in low concn. stimulate and favour the *in-vitro* growth of fibroblasts from the ventricle of chick embryo. High concns. of the two substances inhibit growth and damage the cells, and finally cause death. Histological changes during these phenomena are described. J. N. A.

Prolonged administration of cobra venom in relation to kidney and liver function. D. I. MACHT and D. J. BROOKS (Proc. Soc. Exp. Biol. Med., 1939, 41, 418—421).—Administration to rabbits for 7—22 weeks of doses of cobra venom, comparable with those used as analgesics in man, caused no impairment of kidney function measured by the phenolsulphonaphthalein test or of liver function by Rosenthal's test. V. J. W.

Pharmacology of venom of *Bothrops jararacussu*. E. PECCIARINI (Boll. Soc. ital. Biol. sperim., 1939, 14, 427—429).—The venom (min. lethal, intravenous dose in rabbits 0.8—1.0 mg. per kg.) has no marked action on respiration or blood pressure; its toxicity is due to blood coagulation. F. O. H.

Action of Formosan snake venoms on carbohydrate balance. III. Effect on blood-sugar and liver- and muscle-glycogen of rabbits. IV. Effect on adrenaline content of adrenals and blood of rabbits. T. RI (Folia pharmacol. japon., 1939, 27, 11—14, 19—24).—III. Injection of *Elaps* venoms produces in general no hyperglycaemia, but with acute poisoning caused by *Crotalus* venoms there is considerable hyperglycaemia and liver- and muscle-glycogen are decreased; with chronic poisoning, the hyperglycaemia is gradually reduced, and glycogen slowly increased.

IV. *Elaps* venoms have only an insignificant effect on the adrenaline content of the adrenals and blood, whilst with acute poisoning by *Crotalus* venoms, the amount of adrenaline in the adrenals is considerably decreased and blood-adrenaline is correspondingly increased. J. N. A.

Minimum doses of pharmaceutical substances acting on isolated toad's and frog's heart. I. SIMON (Boll. Soc. ital. Biol. sperim., 1939, 14, 448).—Glucosides and tetra-alkylammonium salts are active in concns. as low as $1:35 \times 10^{12}$; quinine dihydrochloride affects the isolated toad's heart at a concn. of $1:25 \times 10^{14}$. F. O. H.

Use of organic solvents for injection of insoluble pharmaceutical substances. L. ZANON (Boll. Soc. ital. Biol. sperim., 1939, 14, 373—374).—The use of acetmethylamide, ethylene glycol, etc. as solvents for intravenous injection is followed by toxic effects, pptn. and retention of the solvent at the site of injection, and abnormal utilisation of the drug; their use is therefore deprecated. F. O. H.

Acute and sub-acute toxicity of morpholine. T. E. SHEA, jun. (J. Ind. Hyg., 1939, 21, 236—245).—The min. lethal dose of diluted morpholine was 1.6 g. per kg. for rats and 0.9 g. per kg. for guinea-pigs. Daily administration of small doses of dil. morpholine to rats and guinea-pigs caused irritation of the gastro-intestinal tract; toxic changes, progressing to necrosis, were observed in liver and kidney, with congestion and alveolar desquamation in lungs. Similar effects were produced by inhalation and by application to the skin; inhalation caused marked inflammatory reaction in the lungs. The lung damage was characteristic of ammoniacal gases, and application of neutralised morpholine to the skin caused no toxic changes. E. M. K.

Urticarial action of chloro-oximes. M. MILONE (Annali Chim. Appl., 1939, 29, 360—366).—Chloro- and chloro-oximino-acetone and their oximes, ω -chloroacetophenoneoxime, and ω -chloro-oximinoacetophenone were examined for urticarial action on dermal application (rat). Chloro-oximinoacetone (detailed prep. given) is the most effective. F. O. H.

Seasonal atopic dermatitis; rôle of inhalant atopens. S. M. FEINBERG (Arch. Dermatol. Syphilol., 1939, 40, 200—207).—Discussion of 14 cases. C. J. C. B.

Immunologic relationships between cow's milk and goat's milk. L. W. HILL (J. Pediat., 1939, 15, 157—162).—There is more species-specificity between cow and goat lactalbumin than there is between cow and goat casein, but they are not entirely species-sp. The skin-sensitising antibody characteristic of eczema in the infant often gives crossed reactions with cow and goat lactalbumin. The undetermined antibody of severe milk idiosyncrasy without eczema is not likely to do this.

C. J. C. B.

Transmission of reagin through placenta. M. B. COHEN, S. COHEN, and K. HAWVER (Proc. Soc. Exp. Biol. Med., 1939, 41, 477—478).—A pregnant monkey was injected daily for 7 days preceding delivery with 20 c.c. of serum from a patient hypersensitive to wheat, rye, and pea. The monkey became sensitive but the baby monkey was not, but passive transfer of its serum to human skin gave positive reactions to pea and wheat. V. J. W.

Placental transmission of hypersensitiveness to *Ascaris lumbricoides* actively induced in the pregnant woman. B. ZOHN (Amer. J. Dis. Child., 1938, 57, 1067—1071).—12 non-sensitive pregnant women were given intracutaneous injections of *Ascaris* extract at weekly intervals. At the termination of pregnancy blood was drawn from the mother and from the umbilical cord. The maternal and cord sera were tested by the Prausnitz-Kustner method for the presence of reagins for *Ascaris*. Reagins were demonstrated in 9 of the 11 specimens of maternal blood, but were absent in the corresponding 11 specimens of foetal blood. C. J. C. B.

Action of protein fractions in Schultz-Dale [anaphylactic] experiments. A. NADEL (Z. ges. exp. Med., 1939, 106, 50—58).—Guinea-pigs were sensitised against proteins. The isolated uterus suspended in Tyrode's solution is not desensitised on addition of a protein fraction (obtained from pig's muscle after addition of HCl-pepsin). This protein fraction, however, on injection sensitises guinea-pigs against intact proteins. A. S.

Contact dermatitis from weeds. B. SHEL-MIRE (J. Amer. Med. Assoc., 1939, 113, 1085—1090).—The results of patch testing with oleoresins from various weeds are discussed. C. A. K.

Factor analysis of acne complex with therapeutic comment. J. H. STOKES and T. H. STERNBERG (Arch. Dermatol. Syphilol., 1939, 40, 345—367).—A review of 13 factors of aetiological importance in acne. C. J. C. B.

Effect of fever therapy on carbohydrate metabolism. M. B. KIRSTEIN and L. BROMBERG (J. Lab. clin. Med., 1939, 25, 7—10).—Hyperglycæmia during fever therapy is due not to blood concn. but to disturbances in carbohydrate metabolism. C. J. C. B.

Stabilisation of readily oxidised, pharmaceutical substances. L. DONATELLI (Boll. Soc. ital. Biol. sperim., 1939, 14, 429—432).—Adrenaline preps. (0.001%) are stabilised by addition of Na ascorbate (0.005%) and (as fungicide) nipagin (0.1%) without loss of pharmacological activity. F. O. H.

Combined action of two drugs with similar effects. M. KATOH (Folia pharmacol. japon., 1939, 27, 17—18).—A discussion of the combined effect (addition or synergism) of two similar drugs and the conditions necessary for its determination. J. N. A.

Effects of serum transfer in patients with rheumatic fever. M. FRIEDMAN, R. KLEIN, and P. ROSENBLUM (Amer. J. Dis. Child., 1938, 56, 1304—1311).—Serum originally obtained from patients during the acute phase of rheumatic fever was injected intravenously into the same patients during convalescence. After some days, it evoked symptoms and signs suggestive of the original disease in 6 of 7 patients. When the same type of serum was injected intravenously into other patients during convalescence it produced a slight immediate reaction during the first 24 hr. in 1 patient and no reaction in the other 3 tested. No evidence of any beneficial effect followed

the use of convalescent serum in 4 patients with acute rheumatic fever. C. J. C. B.

Prevention of anæsthetic explosions. P. D. WOODBRIDGE, J. W. HORTON, and K. CONNELL (J. Amer. Med. Assoc., 1939, 113, 740—744).—High-resistance coupling between the patient, operating table, anæsthetist, and anæsthetic apparatus is suggested as a means of preventing ignition of anæsthetic gases by static spark. C. A. K.

Pharmacological organotropism. II. E. MENEGHETTI (Boll. Soc. ital. Biol. sperim., 1939, 14, 573—575).—Polemical (cf. Mascherpa, A., 1939, III, 1004). F. O. H.

(xxi) PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

Blood chemical changes during recovery from exhaustive muscular exercise. H. SELYE (Canad. J. Res., 1939, 17, D, 109—112).—Intense muscular exercise in rats causes marked hyperchloræmia, which is maintained for several days after cessation of exercise. Red cell concn. decreases simultaneously and hæmatocrit vals. persist at a low level for at least the first 72 hr. of recovery. Blood-sugar, which decreases during exercise, shows a marked secondary increase even if animals are fasted during the recovery period. A. G. P.

Adrenaline and muscular exercise. F. C. COURTICE, C. G. DOUGLAS, and J. G. PRIESTLEY (Proc. Roy. Soc., 1939, B, 127, 288—297).—Exercise diminishes the hyperglycæmia caused by a given dose of adrenaline, but has little effect on the simultaneous rise of blood-lactic acid. The exercise itself was not sufficiently severe to cause an accumulation of lactic acid. The changes in R.Q. produced by adrenaline do not support the hypothesis that the rise of R.Q. is mainly due to an increase in the proportion of carbohydrate oxidised. F. B. P.

Physiological differences in draft-horses as correlated with their performance. V. I. PATRUSCHEV (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 182—184).—Differences are recorded in blood chemistry and physics between horses giving good and indifferent performances in load hauling. W. F. F.

Changes in the heart and blood vessels of the lungs in experimental silicosis and silico-tuberculosis. G. HEGEMANN (Arch. Gewerbepath. Gewerbehyg., 1938, 9, 228—247).—Histological changes in the lung tissues are described in detail. No regular relation between these changes and the occurrence of hypertrophy of the right auricle could be established. There was no atrophy of the heart in tuberculosis which could prevent hypertrophy in silico-tuberculosis. M. A. B.

Atmospheric dusts in cement plants and their effects on the lungs of employees. L. U. GARDNER, T. M. DURKAN, D. M. BRUMFIEL, and H. L. SAMPSON (J. Ind. Hyg., 1939, 21, 279—318).—The processes of milling and crushing the raw materials may produce considerable quantities of dust containing 1—30% of free SiO₂, but much of the free SiO₂ is present in particles too large to be dangerous.

In the quarries the hazard is slight because the natural ventilation is good and the exposure is intermittent, although the dust sometimes has a high free SiO_2 content. Finished cement dust contains practically no free SiO_2 . Clinical and radiological examination of 2278 workers in 17 plants indicated that prolonged exposure to dust from finished cement produced such slight anatomical reaction that the radiogram was normal. The mixed dusts of the mills, which contained free SiO_2 , were probably responsible for a limited no. of cases of marked linear exaggeration, non-disabling in character. Only two individuals exposed to sandstone dust in special operations showed nodulation resulting from their cement industry employment. The incidence of tuberculosis and other chronic affections of the lungs was less than that in the general population. In this industry non-sp. factors associated with age had more effect in producing slight degrees of linear exaggeration in the pulmonary roentgenogram than had the inhalation of dust.

E. M. K.

Chemical properties of siliceous industrial dusts. H. V. A. BRISCOE (*J. Soc. Arts*, 1939, 88, 104—122).—A lecture.

Effects on animals of prolonged exposure to sulphur dioxide. F. R. WEEDON, A. HARTZELL, and C. SETTERSTROM (*Contr. Boyce Thompson Inst.* 1939, 10, 281—323).—Guinea-pigs, mice, grasshoppers, and cockroaches were practically unaffected by an atm. containing 30 p.p.m. of SO_2 . Susceptibility was uninfluenced by age or by pre-treatment with SO_2 but was increased by exercise when the $[\text{SO}_2]$ was 1000 p.p.m. The lethal dose was higher for intermittent than for continuous exposure over the same total period. Mice were more resistant than guinea-pigs to $[\text{SO}_2]$ not exceeding 150 p.p.m. but were more susceptible to concns. above 300 p.p.m. Visible symptoms and pathological changes associated with SO_2 poisoning are described.

A. G. P.

Chronic exposure to benzene. I. Industrial aspects. M. BOWDITCH and H. B. ELKINS. **II. Clinical effects.** F. T. HUNTER. **III. Pathological results.** T. B. MALLORY, E. A. GALL, and W. J. BRICKLEY (*J. Ind. Hyg.*, 1939, 21, 321—330, 331—354, 355—393).—I. Working conditions in a no. of plants making artificial leather are described, and the results of determinations of benzene in the air are given. 8 fatal cases of poisoning occurred in plants where the concn. of benzene varied from 100 to 200 p.p.m. The ratio of inorg. to org. urinary SO_4 varied inversely with the concn. of benzene in the air; this ratio fell gradually during the day's exposure, but returned to normal not many hr. after the end of the exposure. The val. of the ratio was a good indication of average exposure, but determination of air concn. was necessary to indicate the origin of the benzene. Max. allowable concn. should be 75 p.p.m., corresponding with a urine- SO_4 ratio of 50%, but poisoning may occur even below these limits.

II. Results of examination of 89 individuals exposed to benzene fumes are described. The most useful early signs of poisoning are a decrease in the percentage of polymorphonuclear cells, eosinophilia, and the presence of immature cells in the blood.

There was no instance of leukopenia without other abnormality; leukopenia and anæmia, which may be megalocytic or microcytic, indicate more severe poisoning. Women are no more susceptible to poisoning than men, and acclimatisation to the fumes does not seem to occur. The first signs of poisoning may appear with the onset of an infection long after exposure has ceased.

III. In 19 cases with a history of prolonged exposure significant changes were regularly found in the bone marrow, liver, spleen, and lymph nodes; there was frequent purpura of the skin, mucous membranes, and serous surfaces. The state of the bone marrow varied from severe hypoplasia to extreme hyperplasia, the latter being more common. Well-defined foci of hæmatopoiesis were seen in the spleen, small foci of erythroblastic tissue in the liver, and myeloid metaplasia in the lymph glands. In some cases, the appearance of hæmatopoietic tissue suggested a neoplastic tendency. Two cases showed typical leukæmia. There was no correlation between reaction of hæmatopoietic tissues and intensity of exposure, interval since exposure, or age.

E. M. K.

Benzene poisoning in the rotogravure printing industry in New York City. L. GREENBURG, M. R. MAYERS, L. GOLDWATER, and A. R. SMITH (*J. Ind. Hyg.*, 1939, 21, 395—420).—Benzene concn. in the work-room atm. of 3 plants ranged from 11 to 1060 p.p.m. 130 workers out of a total of 332 examined showed varying degrees of poisoning, cases occurring in one plant where the benzene concn. did not exceed 298 p.p.m., and was often below 100 p.p.m. Symptoms and blood abnormalities are described. There was no correlation between blood abnormalities and clinical signs and symptoms. A reduction in no. and increase in size of the erythrocytes were the earliest signs of poisoning. Normal ratios of inorg. to org. urinary SO_4 were found in 5 out of 18 workers exposed to benzene in considerable concn.

E. M. K.

Hæmatological effects of benzene poisoning. L. A. ERF and C. P. RHOADS (*J. Ind. Hyg.*, 1939, 21, 421—435).—Common symptoms in a series of 9 cases are described. The hæmatological findings varied, but some degree of anæmia, leukopenia, thrombocytopenia, and increase in reticulocytes was present in all cases. Sternal bone marrow showed changes varying from hypoplasia to hyperplasia. The icterus index was often raised, serum-bilirubin was slightly increased, and excretion of urobilinogen was increased, suggesting that an increased rate of destruction of erythrocytes may be one cause of the anæmia; excretion of urobilinogen returned to normal with recovery. The anæmia was usually macrocytic, but the colour index fell with recovery. There was no correlation between severity of disease and intensity of exposure. One patient died of myeloid leukæmia.

E. M. K.

Toxicology of electric welding. M. DE LAET and M. WISER (*Bull. Acad. roy. méd. Belg.*, 1939, 4, 240—250).—Ocular and gastric complaints were the prominent symptoms in 14 workers occupied with electric and oxyacetylene welding for periods of 2—27 years. No ocular lesions were found, and the symp-

toms (lacrimation, photophobia, burning sensation) usually disappear after a day's rest; they are probably due to the occasional discarding of goggles. A const. finding was hypochromic polycythæmia, associated in 9 cases with relative lymphocytosis and in 4 cases with neutrophilia. As, Mn, and CO are discussed as possible ætiological factors but no definite conclusions are reached.

H. L.

(xxii) RADIATIONS.

Penetration of rays through the skin and radiant energy for treatment of wounds. (SIR) L. HILL (*J. Soc. Arts*, 1939, 88, 88—99).—A lecture.

X-Ray densitometer for measuring relative density of muscle, bone, and other tissues. H. E. WEBBER (*Science*, 1939, 90, 115—116).—A densitometer for use with X-ray films, reading tissue density in terms of galvanometer deflexion.

W. F. F.

Biological experimentation with wave-lengths of less than one metre. (A) Apparatus. (B) Neuro-muscular stimulation. E. TOSATTI (*Boll. Soc. ital. Biol. sperim.*, 1939, 14, 391—394, 394—396).—(A) The construction of an apparatus capable of emitting waves of λ 0.6—1 m. is described.

(B) With sciatic-gastrocnemius (frog) preps., the irradiation modifies rheobase and chronaxie. Similar phenomena occur with λ 1.5—3 m.

F. O. H.

Length of daylight period and pelt cycle of the mink. T. H. BISSONNETTE and E. WILSON (*Science*, 1939, 89, 418—419).—The assumption of the winter prime pelt by mink may be induced in summer or hastened in autumn by a reduction of the period or intensity of exposure of the animal to daylight.

W. F. F.

Action of ionising rays on sea-urchin. III. Recovery phenomenon in effects of β -rays on unfertilised eggs and sperm. K. MORI, M. MIWA, and H. YAMASHITA (*Gann*, 1939, 33, 316—321).—For a given total dose of radiation the delay in cleavage time of eggs decreases with increasing time of exposure. With sperm it is almost const.

E. B.

Action of X-rays on goldfish. F. ELLINGER (*Proc. Soc. Exp. Biol. Med.*, 1939, 41, 527—529).—Radiation with 1500 r. was uniformly fatal after 10—18 days. 1000 r. caused a 50% mortality. Fatal cases showed pigmentation and atrophy of lymphoid tissue.

V. J. W.

Effect of X-rays on coccidia of the rabbit. R. F. HONESS (*Science*, 1939, 89, 486).—Laboratory animals, valuable stock, and pets may be freed from coccidia by X-rays.

W. F. F.

Effect of radiations on *B. coli*. S. LURIA (*Compt. rend.*, 1939, 209, 604—606).—If *B. coli*, distributed on gelose, is irradiated with α -particles and then cultured, the relationship between the dose and the no. of colonies which develop is exponential. With X-rays in increasing doses, the curve is at first above and then below the exponential curve. Examined microscopically after irradiation with a moderate dose of α -particles of X-rays, some bacilli appear normal, others cease to divide, and others are much enlarged. The giant bacilli may disappear,

or divide to give normal colonies or, after 2—3 divisions, produce abortive colonies. Formation of giant bacilli is more common after X-irradiation and may account for the departure of the curve from the exponential curve.

J. L. D.

Statistical control of biological applications of mitogenetic rays. C. MAXIA (*Boll. Soc. ital. Biol. sperim.*, 1939, 14, 442—443).—Results for the effect of mitogenetic irradiation (Gurwitsch, A., 1935, 400) of sea-urchin's eggs are statistically significant. Statistical aspects of other workers' results are discussed.

F. O. H.

(xxiii) PHYSICAL AND COLLOIDAL CHEMISTRY.

p_H in living cells. J. SPEK (*Ergebn. Enzymforsch.*, 1937, 6, 1—22; *Chem. Zentr.*, 1937, i, 3350).—A discussion of methods of measurement.

A. J. E. W.

Difference of potential between white and yolk of hen's egg. V. CAPRARO and P. FORNAROLI (*Arch. Sci. biol.*, Napoli, 1939, 25, 117—125).—The p.d. between egg-white and yolk was 2—3 mv., whereas 130 mv. would be expected if the p_H difference between them were due to a Donnan equilibrium. The great difference in concn. of ions between white and yolk may be due to their offering a high resistance to diffusion. The diffusion coeff. of lactic acid in the yolk is small (approx. 0.045).

S. O.

The pK'_1 of carbonic acid in concentrated protein solutions and muscle. I. S. DANIELSON, H. I. CHU, and A. B. HASTINGS (*J. Biol. Chem.*, 1939, 131, 243—257).—When concns. are calc. as mol. per kg. of water, pK'_1 is not influenced by protein, the val. at 38° being 6.10.

H. G. R.

Effect of temperature on the permeability of cells of *Tolypellopsis stelligera*. V. WARTIOVAARA (*Biochem. Z.*, 1939, 302, 277—279).—Changes in permeability consequent on temp. changes occur very rapidly (in less than 1 min.). The temp. coeffs. (Q_{10}) of rate of permeation by non-electrolytes range at 20° from 2.55±0.22 for urea to 8.90±1.05 for hexamethylenetetramine and remain almost unchanged between 0° and 30° (greatest deviation 20%). The magnitude of the coeff. depends on the mol. size, the lowest vals, being obtained with substances having $[R_p]$ below 20. There is no direct relation between the coeffs. and the permeating power or solubility in ether of the substances. The experiments are made in a special apparatus. Results are not in accord with the theory of Danielli and Davson (A., 1935, 1012).

W. McC.

Permeability of membranes to calcium salts.—See A., 1940, I, 23.

Reactions with monolayers and their biological analogies. E. K. RIDEAL and J. H. SCHULMAN (*Nature*, 1939, 144, 100—102).—A parallelism is developed between monolayer surface reactivity and biological action.

W. F. F.

Spreading of different hæmoglobins, muscle hæmoglobins, and cytochrome c. J. H. P. JONXIS (*Biochem. J.*, 1939, 33, 1743—1751).—All hæmoglobins cover the same max. area (9400 sq. cm.

per mg.) in the compressed state, although the time taken to attain this area at the isoelectric point is different for different species, but is independent of the ionic concn. of the solution on which they are spread. Small concns. of urea exert little effect, although higher concns. reduce the unfolding time. Reduced hæmoglobin spreads more rapidly than oxyhæmoglobin, whilst the reverse is true for cytochrome *c*. Muscle-hæmoglobin does not form monolayers at p_H 4—11, but the reduced compound does so at p_H 6.8.

P. G. M.

Changes in the property of imbibition of nuclear colloids following trauma. G. DELOFFRE (Compt. rend., 1939, 209, 572—574).—Traumatism (English and Bonner, A., 1938, III, 159) probably acts by increasing the ability of the nuclear colloids to absorb water and accounts for the increase in nuclear vol. in the early stages of cicatrisation. This effect may be an essential first stage in cell division.

J. L. D.

Binding of strontium by gelatin. C. BARTORELLI (Arch. Sci. biol., Napoli, 1939, 25, 156—168).—A detailed account of work already noted (A., 1939, III, 785).

S. O.

(xxiv) ENZYMES.

Enzyme reactions in heavy water. K. F. BONHÖEFFER (Ergebn. Enzymforsch., 1937, 6, 47—56; Chem. Zentr., 1937, i, 3350).—A discussion.

A. J. E. W.

Respiratory enzyme systems. H. VON EULER and H. HELSTRÖM (Arkiv Kemi, Min., Geol., 1939, 13, B, No. 1, 8 pp.).—Succino-dehydrogenase is activated by reduction with $Na_2S_2O_4$ and inactivated by oxidation with $Fe(CN)_6^{3-}$, both reversibly. H_2O gives permanent inactivation, due to denaturing of the protein. The dehydrogenase contains in the prosthetic group one or more thiol groups, which are the active groups in dehydrogenation and in the interaction with cytochrome. Sarcoma contains no cytochrome and only 10% of the diaphorase and 5% of the cytochrome-oxidase of normal muscle.

M. H. M. A.

Enzyme studies. II. H. VON EULER, H. HELSTRÖM, and N. FORSMAN (Arkiv Kemi, Min., Geol., 1939, 13, B, No. 2, 4 pp.).—Little difference is found in the catalase activity of extracts of muscle and Jensen sarcoma. Exposure to light of ultra-short λ of rats with Jensen sarcoma causes only slight weakening of succino-dehydrogenase but a diminution of the cozymase content by about 40% of the normal val. Similar exposure of suspensions of top yeast *R* causes a condition resembling plasmolysis. Cozymase is extensively inactivated. Under like conditions an increase in the time of decolorisation is observed with mixtures of dialysed sarcoma extract, buffer, glycogen, and methylene-blue; this does not appear due to the inactivation of cozymase but to an unexplained denaturation of apoenzymes by irradiation or by the consequent increase in temp.

H. W.

Method for studying tissue dehydrogenase activity. M. CALGINAI (Arch. Sci. biol., Napoli, 1939, 25, 89—99).—The amount of H donators in minced tissues is determined by using increasing

quantities of methylene-blue until decolorisation no longer occurs. The total enzymic activity is estimated in the presence of an excess of H donators (sterile bacteriological broth) by measuring the decolorisation time of a certain amount of methylene-blue.

S. O.

isoCitric acid dehydrogenase and glutamic acid synthesis in higher plants and yeasts. H. VON EULER, E. ADLER, G. GÜNTHER, and L. ELLIOT (Enzymologia, 1939, 6, 337—341; cf. A., 1939, III, 786).—A codehydrogenase-II-sp. *isocitric acid apodehydrogenase*, activated by Mg^{++} and Mn^{++} , and identical with that previously found in animal tissue, is present in higher plants and yeasts. The glutamic acid apodehydrogenase of higher plants is sp. for codehydrogenase-I, that of yeast and *B. coli* for -II, whilst that of animal tissue acts with -I or -II.

E. M. W.

isoCitric acid dehydrogenase. H. VON EULER, E. ADLER, and M. PLASS (Arkiv Kemi, Min., Geol., 1939, 13, B, No. 4, 5 pp.).—The time of decolorisation of solutions of methylene-blue and Na *isocitrate* by *isocitric acid dehydrogenase* from heart muscle, codehydrogenase I or II, and flavin enzyme has been measured at 30°. Codehydrogenase II is the sp. coenzyme of *isocitric acid apodehydrogenase*. The presence of the flavin enzyme accelerates the decolorisation of the dye.

H. W.

Constitution of codehydrogenase. II. F. SCHLENK, B. HÖGBERG and S. LINGSTAM (Arkiv Kemi, Min., Geol., 1939, 13, A, No. 11, 8 pp.).—Codehydrogenase II is not transformed into cophosphorylase under conditions which lead to the formation of the latter substance in good yield from cozymase. The third phosphoric acid residue is not easily removed by acid hydrolysis (Lohmann).

H. W.

Oxidation of d(+)-proline by d-amino-acid oxidase.—See A., 1940, II, 7.

Inactivation of tyrosinase in the oxidation of pyrocatechol. B. J. LUDWIG and J. M. NELSON (J. Amer. Chem. Soc., 1939, 61, 2601—2606).—Tyrosinase (prep. described) from *Psalliota campestris* is inactivated during oxidation of pyrocatechol, this result requiring at 25° 100 ± 5 cu. mm. of O_2 per unit of enzyme or 3.3×10^4 cu. mm. per $\mu g.$ of Cu. The amount of O_2 required is independent of the rate of oxidation of the pyrocatechol, the concn. of O_2 (100% O_2 or 1 : 49 O_2 - N_2), p_H (5—7.5), and the ratio of pyrocatecholase to cresolase activity, but varies with temp. (80 cu. mm. per unit of enzyme at 35°) and the source of the enzyme (400 ± 15 cu. mm. at 25° for the enzyme from *Lactarius piperatus*). Quinol, used with a deficiency of pyrocatechol, not only reduces the *o*-benzoquinone formed, but also delays inactivation of the enzyme. Ascorbic acid acts similarly as reductant, but does not delay inactivation. Benzoic acid reduces the rate of uptake of O_2 , but does not affect the inactivation; in excess it prevents all oxidation, but its subsequent removal by dialysis allows the reaction to proceed normally. It is concluded that the enzyme and pyrocatechol form a complex oxidisable by mol. O_2 , and that the effect of reducing agents, benzoic acid, etc. depends on whether

or not they or the pyrocatechol are preferred as partners in the enzyme complex. R. S. C.

Tyrosinase from the wild mushroom, *Lactarius piperatus*. H. R. DALTON and J. M. NELSON (J. Amer. Chem. Soc., 1939, 61, 2946—2950).—*L. piperatus* yields a tyrosinase containing 1000 cresolase and 100 phenolase units per mg., this ratio being unchanged by purification; 0.0027 μ g. of Cu is present per cresolase unit. The prep. shows an absorption band at 273 m μ . due to protein and at \sim 330 m μ . due to Cu. It yields about 10% of crystals (Cu 0.25, N 13.6%), which have only slight activity (increasing when kept), but similarity in absorption spectrum and composition indicates a close relation to the enzyme. R. S. C.

Apparatus for gasometric determination of catalase in plant tissues. V. S. SCHARDAKOV (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 65—66).—The O₂ liberated from H₂O₂ by the finely ground tissue is measured volumetrically in an apparatus (described in detail) which is more convenient than those commonly used especially when a series of readings is required. W. O. K.

Spectroscopic determination of cytochrome c and its distribution in mammalian tissues. R. JUNOWICZ-KOCHOLATY and T. R. HOGNESS (J. Biol. Chem., 1939, 131, 187).—The results for the cytochrome content of mammalian tissues (A., 1939, III, 938) should be multiplied by the factor 0.79 owing to Theorell's report (A., 1939, III, 939) that cytochrome contains 0.43% Fe instead of 0.34%. H. G. R.

Action of pancreas lipase on monostearyl-glycerides. F. P. MAZZA and C. MALAGUZZI-VALERI (Arch. Sci. biol., Napoli, 1939, 25, 270—278).—The hydrolysis of $\beta\gamma$ -dimethyl- α -stearyl- and $\alpha\gamma$ -dimethyl- β -stearyl-glycerides by pancreatic lipase at 20° was studied. Equilibrium is reached, by 15% hydrolysis of the ester linking, after about 80 and 120 min. respectively. The hydrolysis consts. were 163×10^{-6} and 70×10^{-6} respectively. The prep. of the substrates is described. S. O.

Comparison of lipolytic activity of sulphate- and acetone-preparations of rabbit liver. B. I. GOLDSTEIN and E. S. ELIASCHKEVITSCH (Ukrain. Biochem. J., 1939, 13, 559—574).—Dehydration of rabbit's liver by treatment with acetone and ether considerably reduces its lipolytic activity, inactivation being total with new-born animals. Preps. dehydrated by grinding with anhyd. Na₂SO₄ retain the full activity of the fresh tissue, and may be stored for long periods without significant deterioration. R. T.

Reversibility of *d*-amino-acid deamination. N. B. DAS and H. VON EULER (Arkiv Kemi, Min., Geol., 1939, 13, B, No. 3, 6 pp.).—Leuco-neutral-red (neutral red reduced with Na₂S₂O₄ in a vac.) is re-oxidised by pyruvate and NH₃. The reaction requires the co-operation of all the components, e.g., pyruvate, NH₃, and the thermolabile enzyme containing the co-enzyme. Glutathione cannot substitute the enzyme. The re-oxidation of leuco-neutral-red is inhibited by alanine. Pyruvic acid inhibits the

oxidation of alanine to a considerable extent. The reaction catalysed by *d*-amino-acid deaminase is probably reversible. Enzymes from pig kidney and liver oxidising *dl*-proline, alanine, phenylalanine, valine, and leucine require for their activity the co-enzyme prepared from heart muscles according to Straub (A., 1938, III, 528). H. W.

Histaminase. I. Chemical determination of activity. K. TAKAHASHI and T. UMEDA (J. Agric. Chem. Soc. Japan, 1939, 15, 939—946).—A solution of histamine is treated at 38° with an adsorbate of the enzyme from pig-kidney powder on Japanese acid clay and the residual histamine determined colorimetrically after 24 hr. by Pauly's diazo-reaction. A correction is applied for the histamine adsorbed by the clay. A curve showing the inactivation of histamine by varying amounts of the enzyme is given. J. N. A.

Activation of arginase. A. ROSSI (Arch. Sci. biol., Napoli, 1939, 25, 189—198; cf. A., 1939, III, 517).—FeSO₄, if present in sufficient concn., activates arginase. Cysteine has no effect on crude preps. but inhibits the activity of a purified enzyme. When FeSO₄ and cysteine are added together, an activation is always produced, even at concns. at which either compound separately would have no effect. A Fe^{II}-dipyridyl complex activates (for equal concns. of Fe) more than the mixture FeSO₄-cysteine. S. O.

Nucleotidase. N. B. DAS (Arkiv Kemi, Min., Geol., 1939, 13, A, No. 7, 13 pp.).—Intestinal mucosa, brain, kidney, liver, and heart of pig, and liver and sarcoma of rat, contain varying proportions of four enzymes dephosphorylating cozymase, adenylic acid, inosic acid, and glycerophosphoric acid, respectively. Relative rates of dephosphorylation vary with the source of the enzymes. In all cases the attack on adenylic acid is more rapid than on cozymase. Although yeast- and muscle-adenylic acid are attacked at the same rate, glutathione inhibits attack on the former more than that on the latter. Glutathione inhibits attack on adenylic acid more than does AsO₃^{'''} and oxalate, and the attack on glycerophosphoric acid more than does oxalate; CaCl₂, NaF, and iodoacetate have no action. Mg activates attack on glycerophosphoric acid, adenylic acid, and cozymase to extents which decrease in the order named. Complete separation of the enzyme attacking adenylic from that attacking glycerophosphoric acid was not possible. Decreases in the ratio, rate of attack on glycerophosphoric acid/rate of attack on adenylic acid, were obtained on incubation at 60° for 10 min. at *p*_H 6, on pptn. at *p*_H 4.7 and re-dissolution at *p*_H 8.6, and after adsorption at *p*_H 5.5 on MgO or C. The optimum *p*_H for attack on adenylic and glycerophosphoric acids is 9.2—10.0, and on inosic acid 7.6—8.6. Above *p*_H 8.0, cozymase is hydrolysed non-enzymically. Rat liver extract attacks adenylic acid faster than does rat sarcoma extract, the latter having a higher optimum *p*_H. M. H. M. A.

Enzymic fission of thymonucleic histone. A. ROSSI and F. DEL REGNO (Boll. Soc. ital. Biol. sperim., 1939, 14, 396—397).—Nucleo-phosphatase (ox intestinal mucosa) hydrolyses thymonucleic acid

but not the histone, which, however, is hydrolysed by the phosphatase in presence of pancreatin. Nucleosidase (spleen), either alone or with pancreatin, is inactive but hydrolyses the histone in presence of nucleo-phosphatase + pancreatin. The modes of hydrolysis are indicated. F. O. H.

Peptic digestion of ovalbumin. A. TISELIUS and I. B. ERIKSSON-QUENSEL (Biochem. J., 1939, 33, 1752—1756).—Peptic digestion of ovalbumin appears to be an "all or none" reaction since, even after prolonged digestion in acetic acid medium, both acid-denatured albumin and the end products are present, but no intermediate products can be recognised. P. G. M.

Effect of protein content of diet on activity of tissue-proteinases. M. D. MULARTSCHUK (Ukrain. Biochem. J., 1939, 13, 515—540).—The cathepsin activity of extracts of liver (rat, rabbit) rises with increasing protein content of the diet, whilst the reverse is true for kidney extracts. The latter effect is ascribed to development of nephrosis in animals fed large amounts of protein. The inactivating effect of H_2S on liver-cathepsin is more marked with high- than with low-protein diets. Storage at 0° leads to considerable inactivation of the extracts, this being greater with high- than with low-protein feeding; such extracts are fully reactivated by H_2S . R. T.

Enzymic hydrolysis of muscle-proteins. I. A. SMORODINCEV and V. P. SHIGALOV (Ukrain. Biochem. J., 1939, 13, 647—669).—Under optimum conditions (p_H 1.4, 37°) 80% of the action of pepsin on meat is completed within 3 hr., and results in liberation of 30% of the total N as amino-groups. Second-grade meat is less completely digested, whilst only half as much amino-N is liberated from sinews as from meat. Raw meat is more readily digested than is cooked meat; the reverse is true with pancreatin. Pig pancreatin is more active than is that from cattle. 63% of total N is liberated as amino-N by digestion with pepsin for 3 hr., followed by 3 hr. with pancreatin. The digestibility of first- and second-grade meat and of sinew by pancreatin is comparable with that with pepsin. R. T.

Changes in trichloroacetic acid precipitates of protein fission products by hydrogen peroxide. M. CALCINAI (Biochim. Terap. sperim., 1939, 26, 437—448).—The action of H_2O_2 at either 0° or 37° increases or reduces the fraction pptd. by trichloroacetic acid from papain digests of ovalbumin or peptone (cf. A., 1939, III, 961). F. O. H.

Purified, dry preparations of lysozyme. I. S. BUJANOVSKAJA (Microbe Variability Conf., 1936, 471—474).—Lysozyme adsorbed on kaolin was not eluted at p_H 4.5—14. Attempts at purification of lysozyme by cataphoretic methods were unsuccessful. The best results were obtained by pptn. with alcohol, followed by extraction of the ppt. with water. The titre of the aq. extracts bore no relation to their total N or amino-N content. R. T.

Lysozyme, its properties and applications. Z. V. JERMOLIEVA and I. S. BUJANOVSKAJA (Microbe Variability Conf., 1936, 459—470).—The prep.,

properties, and therapeutic applications of lysozyme are described. R. T.

Nature of enzymes. I. Amylase and pepsin. L. E. ROZENFELD, A. A. RUCHELMAN, and A. A. SHURAVSKA (Ukrain. Biochem. J., 1939, 13, 541—558).—Amylase is inactivated by aniline or NH_2OH ; this effect is due to combination of these reagents with an aldehyde group necessary for activity of the enzyme. The activity of pepsin is unaffected by the above reagents. R. T.

Conversion of starch into crystalline dextrins by the action of a new type of amylase separated from cultures of *Aerobacillus macerans*. E. B. TILDEN and C. S. HUDSON (J. Amer. Chem. Soc., 1939, 61, 2900—2902).—The aq. fluid from cultures of *A. macerans* contains an enzyme which hydrolyses gelatinised starch to a mixture, $[\alpha]_D +203^\circ$, containing the cryst. α - and β -dextrins of Schardinger but no reducing sugars. The enzyme is active at p_H 5.6—6.4 and is pptd. by 37.5% acetone; 40° is the optimum temp. R. S. C.

Enzymic preparation of *d*-galacturonic acid. H. H. MOTTERN and H. L. COLE (J. Amer. Chem. Soc., 1939, 61, 2701—2702).—Prep. of this acid from apple or citrus pectin by a commercial pectinase is described. R. S. C.

[Enzymic] preparation of *d*-galacturonic acid. I. A. MANVILLE, F. J. REITHEL, and P. M. YAMADA (J. Amer. Chem. Soc., 1939, 61, 2973—2974).—Further details are given for this prep. (cf. *supra*), so as to increase the yield to 36%. R. S. C.

β -Glucuronidase. II. Factors controlling the initial velocity of hydrolysis of some conjugated glucuronides. W. H. FISHMAN (J. Biol. Chem., 1939, 131, 225—232).—The optimum p_H for the hydrolysis by ox spleen glucuronidase of Na α striol, borneol, and menthol glucuronides are 4.3, 4.4, and 5.0, respectively. The rate of hydrolysis of the former is three times that of the other salts under optimum conditions and the affinities of the enzyme for the substrate are 2000, 100, 250 (in the above order). (Cf. A., 1939, III, 423.) H. G. R.

Emulsin. C. MALAGUZZI-VALERI (Arch. Sci. biol., Napoli, 1939, 25, 261—269).—Dialysis of emulsin preps. against acetate buffer at or below the isoelectric point (p_H 6.1) partly inactivates the enzyme (10%, 16%, 26%, and 50—70% in 3, 6, 22, and 24 hr. respectively). Addition of the dialysate causes a more or less complete reactivation. The dialysate gave negative biuret and ninhydrin reactions and contained neither amino- nor thiol groups. S. O.

Inhibitors of invertase. E. BAUR (Helv. Chim. Acta, 1939, 22, 1114—1120).—The inhibitory effects of an extensive range of substances on invertase (from autolysed yeast) in PO_4''' buffer at p_H 4.5 were investigated. The inhibition is uniformly much weaker than that occurring with oxidative enzymes. Complex formation between enzyme and inhibitor is not observed. The varying activity of the inhibitors, including the marked effect of amino-compounds, is discussed. H. W.

Determination of diastase. S. MIHALKOVITS (Magyar Orv. Arch., 1939, 40, 204—214).—A rapid fermentation method is described for determining whether normal or pathological amounts of diastase are present.

A. W. M.

Glycolytic enzymes of fatigued muscles of animals on acidic and basic diets. M. F. GULI (Ukrain. Biochem. J., 1939, 13, 451—460).—Extractability of glycolytic enzymes from rabbit muscle is not affected by fatigue of the muscles, irrespective of whether the diet contains an excess of acidic or of basic constituents. Fatigue raises the activity of the enzyme system in the former, but not in the latter, case.

R. T.

Specificity and action of sweet almond phosphatase. II. Effect of various compounds on hydrolysis of different substrates. J. COURTOIS and J. MANOUVRIER (Enzymologia, 1939, 6, 342—351; cf. A., 1939, III, 872, 941).—Hydrolysis of methyl, *n*-propyl, and *n*-butyl monophosphates by sweet almond phosphatase is slightly inhibited by Mg⁺⁺ and NaF. With NaF, inhibition increases with concn. of substrate. The hydrolysis of these compounds and of β -glycerophosphate is not affected by ascorbic acid or by its oxidation products with methylene-blue or Fe(NO₃)₃, but its oxidation products with I or CuSO₄ inhibit hydrolysis.

E. M. W.

Bone-phosphatase and the growth of the skeleton in the sardine (*Clupea pilchardus*, Walb.). J. ROCHE and J. COLLET (Compt. rend., 1939, 209, 530—532).—The phosphatase activity of the cranial vault, vertebræ, caudal fin, and scales of *C. pilchardus* is determined (cf. A., 1938, III, 406) during the 1st, 2nd, and 3rd annual periods of development. During the 1st year the total phosphatase activity of the skeleton increases until metamorphosis, after which the increase is proportional to the growth rate. When growth is resumed in the spring, phosphatase activity increases, but is much less in the bones of the cranial vault and vertebræ than in the caudal fin and scales.

J. L. D.

Reversible action of pyrophosphatase. A. M. MALKOV and V. V. KAL (Ukrain. Biochem. J., 1939, 13, 633—645).—The optimum p_H for hydrolysis of P₂O₇⁴⁻ by live yeast is 3.5, and for synthesis from PO₄³⁻ 7. Yeast autolysate or dried yeast does not synthesise P₂O₇⁴⁻; the optimum for its hydrolysis by these preps. is p_H 7. Mg activates the reactions with dried or autolysed yeast, but not with live yeast.

R. T.

Effect of nicotinic acid on phosphatase activity. F. DEL REGNO (Boll. Soc. ital. Biol. sperim., 1939, 14, 397—398).—Nicotinic acid in concns. of 0.05—0.10% inhibits hydrolysis of Na glycerophosphate at p_H 9.3 by "alkaline" phosphatase (ox brain); lower concns. are practically without effect.

F. O. H.

Cophosphorylase from the co-enzyme of α -amino-acid oxidase. E. P. ABRAHAM (Arkiv Kemi, Min., Geol., 1939, 13, B, No. 5, 3 pp.).—Adenosine-5-monophosphoric acid is a constituent of cophosphorylase and is involved with a linking which is easily hydrolysed, particularly under alkaline conditions.

H. W.

Determination of co-enzyme I in animal tissues. A. E. AXELROD and C. A. ELVEHJEM (J. Biol. Chem., 1939, 131, 77—84).—Extraction of co-enzyme I from animal tissues and its determination by the method of von Euler and Myrbäck are described. The method is based on the principle that addition of varying amounts of co-enzyme I to a washed yeast prep. produces rates of fermentation which, within certain limits, are proportional to the amount of added co-enzyme I. The rate of evolution of CO₂ is determined in a Barcroft differential respirometer. Co-enzyme II is not determined by the method. The amounts of co-enzyme I in liver, kidney cortex, brain grey matter, gastrocnemius muscle, in blood of guinea-pig, rat, and chicken, and in liver, kidney, muscle, and blood of dog, and human blood are determined.

J. N. A.

Catalytic activity of enzymes on organic adsorbents.—See A., 1940, I, 22.

(xxv) MICROBIOLOGICAL AND IMMUNOLOGICAL CHEMISTRY.

Glutathione and alcoholic fermentation. II. Glutathione and inhibition of alcoholic fermentation by monohalogenoacetic acids. P. BOLOMEY (Ann. Ferm., 1939, 5, 257—284; cf. Haag and Bolomey, A., 1939, III, 520, 724).—Yeasts acclimatised to definite concns. of monohalogenoacetic acids show reduced growth, fermentative power, and respiration. The acids reduce the proportion of glutathione in the yeast, there being no const. relation between this reduction and the stopping of fermentation. Inhibition may be complete without reduction in thiol concn. in faintly acid solution or with 15% reduction in neutral solution. Added glutathione cannot reactivate inhibited fermentations in acid or neutral media, but gives a partial reactivation in alkaline media. A previously prepared mixture of monohalogenoacetic acids and glutathione does not inhibit fermentation, the glutathione exerting a protective influence. Inhibition by the acids is independent of their influence on the yeast-glutathione.

I. A. P.

Absorption and fluorescence spectra in relation to photolethal action of methylcholanthrene on yeast. A. HOLLAENDER, P. A. COLE, and F. S. BRACKETT (Amer. J. Cancer, 1939, 37, 265—272).—Methylcholanthrene is sol. to the extent of 10⁻⁸ in physiological saline. Near ultra-violet radiation if intense and prolonged has a slightly toxic effect on yeast. Methylcholanthrene in the dark stimulates the growth of yeast; with near ultra-violet radiation it is very toxic to yeast. Measurements of the absorption and fluorescence spectra of methylcholanthrene are given.

F. L. W.

Optimum solutions as physiological reference standards in determining nitrogen utilisation by *Aspergillus niger*. R. A. STEINBERG and J. D. BOWLING (J. Agric. Res., 1939, 58, 717—732).—Growth (wt.) of duplicate cultures of *A. niger* with graduated supplies of NH₄NO₃ was reproducible within 5%. Growth and total N curves with const. supplies of NH₄NO₃ but different levels of carbo-

hydrate were proportional to the carbohydrate supply throughout. At intermediate concns. NH_4Cl produced less and NaNO_3 still less growth than did NH_4NO_3 . In NH_4NO_3 cultures the total N content was a linear function of the N supply assuming the protoplasmic N was 2% of the wt. of the mycelium. Vals. for yield curves were not in accord with Mitscherlich's law of growth. A. G. P.

Copper and *Aspergillus niger*, M. JAVILLIER (Ann. Ferm., 1939, 5, 371—381).—Literature relating to the influence of Cu on the growth and conidia coloration of *A. niger* is critically reviewed; the influences of Zn and Fe are also noted. I. A. P.

Biochemical synthesis of colouring matter by an Indian strain of *Penicillium*. N. N. CHOPRA and J. N. RAY (Current Sci., 1939, 8, 409—411).—A strain of *P. crateriforme* isolated from William pears in the Punjab when grown on a medium containing sucrose (0.5), peptone (0.1), and K_2HPO_4 (0.01%) at 30° for 14—21 days produces a red pigment, 1 l. of culture solution yielding approx. 0.1 g. of crude pigment, m.p. 180—200°. The pigment is readily produced when methyl, ethyl, and amyl alcohol, acetone, glycerol, and tartaric, dihydroxy-tartaric, citric, and mucic acids are used as sources of C, although growth is most prolific when carbohydrates are used. As sources of N, amino-acids, peptides, and peptones are more suitable than inorg. N or proteins. The pigment can be adsorbed on Al_2O_3 , and pptd. from aq. solution by Pb acetate. Boiling with H_2O_2 oxidises it to a colourless compound. J. N. A.

Automycothrophy. V. F. ALTERGOT (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 410—415).—A further investigation of the phenomenon of spontaneous lysis which occurs in species of the genus *Fusarium* has been made. Lysis of *F. nivium* is accelerated at temp., above the optimum, which inhibit growth. A close analogy exists between the lysing factor and growth-substances, e.g., yeast bios. P. G. M.

Chorio-allantoic membrane of developing chick as medium for cultivation and histopathologic study of pathogenic fungi. M. MOORE (Science, 1939, 89, 514—515).—The method is less expensive than that in which standard laboratory animals are used and occupies less time. It is equally effective and is available where animals or human volunteers are not obtainable. W. F. F.

Causes of brown root rot of tobacco. E. D. MATTHEWS, C. A. RENEGER, and R. P. THOMAS (J. Agric. Res., 1939, 58, 673—684).—The occurrence of brown root is not associated with the activity of *Sclerotium bataticola*. The isolated fungus decomposes cellulose, utilising NO_3^- or org. N, and is most active in neutral—alkaline media. It is rapidly destroyed by air-drying. A. G. P.

Changes in reticulo-endothelial system due to infection by *Plasmodium gallinaceum*. P. CHORTIS (R. Ist. San. Pubbl., 1939, 2, 445—452).—Severe infection (presence of schizonts) in fowls is accompanied by phagocytic activity of reticulo-endothelial elements and anæmia due to destruction of erythrocytes. F. O. H.

Apparatus for removal of deleterious bacteria from certain protozoan cultures. W. STEWART (Science, 1939, 89, 492).—An electric field applied to the culture causes the protozoa to migrate to the cathode. They are then removed freed from the bacteria, which remain behind. W. F. F.

Liver extract as substitute for serum in culture medium for *Endamoeba histolytica*. W. W. FRYE and H. E. MELENEY (Science, 1939, 89, 564—565).—Powdered liver extract, as used in the treatment of pernicious anæmia, is dissolved in saline and sterilised; it is then ready for use. In addition to *E. histolytica*, cultures of *Trichomonas hominis* and *Chilomastix mesnili* have been maintained. W. F. F.

Biochemical properties of S and O variants of *Leuconostoc mesenteroides*. B. O. KAGAN (Microbe Variability Conf., 1936, 203—208).—Three variants were isolated: a smooth, non-mucin-producing S variant, and O and R variants producing mucin in aq. sucrose media; these forms exhibit clear-cut biochemical differences. Their activity with respect to inversion of sucrose varies parallel with their mannitol- and mucin-producing power, in the increasing order S, R, O variant. Each variant has a characteristic E_k -time curve, irrespective of the culture medium. R. T.

Effect of fixed nitrogen on *Azotobacter*. L. I. RUBENTSCHIK and M. B. ROZIN (Microbe Variability Conf., 1936, 165—169).—Two strains of *A. chroococcum* lost their ability to fix atm. N_2 after numerous passages through media of high fixed N content. R. T.

Respiration of bacteria. L. A. IVANOV and E. A. STERN (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 503—505).—Apparatus (from ordinary laboratory equipment) is described for the measurement of CO_2 output and O_2 uptake of cultures of, e.g., *Azotobacter*. W. F. F.

***Vibrio amylocella*, n. sp., a soil organism which decomposes cellulose and produces glucose from starch**. P. H. H. GRAY (Canad. J. Res., 1939, 17, C, 154—169).—*V. amylocella* attacks cellulose, starch, dextrin, and sugars and utilises peptone, amino-acids, and mineral salts as sources of N. Glucose is produced from starch or dextrin and accumulates in starch media containing NH_4Cl but not in those containing NaNO_3 . Development of acidity in the medium, e.g., when NH_4Cl is the N source, inhibits the decomp. of glucose. In presence of CaCO_3 glucose is completely decomposed, oxalic acid being among the products. The organism inverts sucrose, produces some glucose and fructose from raffinose, and decomposes lactose and maltose without producing glucose. The diastatic enzyme of *V. amylocella* is more active when separated from the organism. A. G. P.

Disintegration of the cell membrane of the cotton fibre by a pure culture of bacteria. F. E. HOOPER (Contr. Boyce Thompson Inst., 1939, 10, 267—275).—An anaërobic organism utilising cellulosic matter as sole C source with an otherwise inorg. medium is isolated from soil. The cuticle,

cementing material, and the cellulose of the fibre are progressively digested. A. G. P.

Natural groups in cellulolytic anaërobes. J. POCHON (Compt. rend., 1939, 209, 606—608; cf. A., 1938, III, 152).—One group, both parasitic and free-living, ferments cellulose with the formation of acetic and butyric acids. Forms can be cultured which have lost their cellulolytic power, are not strict anaërobes, ferment a variety of sugars, and do not reduce neutral-red or form indole. A group which ferments cellulose only under strictly anaërobic conditions to give formic and acetic acids, can be cultured in very simple media (having lost their parasitic qualities), and become cellulolytic under aerobic conditions. If these are cultured without cellulose, they lose their cellulolytic power. J. L. D.

Halophilic bacteria of salt lakes. L. I. RUBENTSOVIK (Microbe Variability Conf., 1936, 171—174).—Following lowering of the salinity of salt lakes of the Odessa district during 1932—1935 the optimum NaCl concn. for growth of bacteria reducing SO_4 fell from 5—8% to 2—4%, and a similar change was found for halophobifying and thioniacid bacteria. Change in the habit of these bacteria from halophob to halophilic was also observed. The classification of bacteria on the basis of their behaviour in various concns. of NaCl is thus an arbitrary one. R. T.

Biochemical preparation of inosose. A. J. KLUYVER and A. G. J. BOEZAARDT (Rec. trav. chim., 1939, 58, 956—958).—When *Acetobacter suboxydans* is grown in an aerated yeast extract medium containing 3% of mesoinositol for 10 days at 30° an approx. 90% yield of inosose is obtained; by the chemical oxidation of mesoinositol by conc. HNO_3 (Posternak, A., 1937, II, 65) the yield is only 16—25%. J. N. A.

Antagonistic effect of the microflora of sour milk on pathogenic micro-organisms. J. ROMAN (Magyar Orv. Arch., 1939, 40, 183—194).—The rate of increase and the vitality of pathogenic bacteria are less in sour than in fresh milk. This is primarily due to the antagonistic effect of lactic acid bacteria and not of *B. coli*. A. W. M.

Physicochemical aspects of bacterial growth. IV. Conditions determining stationary populations and growth rates of *Bact. lactis aërogenes* in synthetic media. V. Effect of magnesium on lag phase in growth of *Bact. lactis aërogenes* in synthetic media containing phosphate. R. M. LODGE and C. N. HINSHELWOOD (J.C.S., 1939, 1683—1692, 1692—1697; cf. A., 1939, III, 201).—IV. The max. population of *B. lactis aërogenes* which a synthetic medium containing lactose and NH_4 tartrate will support firstly increases in proportion to, and then becomes independent of, the concns. of these constituents. Characteristics of the curves of relationship between no. of organisms and initial p_{H} of the medium (lactose- NH_4 tartrate, dil. or conc. glucose- PO_4) are described. The onset of the stationary phase is due to exhaustion of substances necessary for growth, accumulation of toxic products, and adverse p_{H} ; progressive degeneration of the cells from one generation to another is not a contributory (A., III.)

factor. Different stages of cell division appear to react differently to environmental factors.

V. With synthetic media containing glucose, $(\text{NH}_4)_2\text{SO}_4$, and K phosphate, small inocula of the bacteria will not grow in absence of a limiting concn. (1—20 p.p.m.) of Mg^{++} ; above this concn., growth is normal and independent of the actual val. of $[\text{Mg}^{++}]$. With little or no Mg^{++} present, a lag period (of duration depending on $[\text{Mg}^{++}]$) precedes normal logarithmic growth; during this lag period, an essential, intermediate growth substance is being synthesised and the organisms are dying. Thus, if the lag period exceeds a certain val., no growth ensues. F. O. H.

Anaërobic decomposition of cysteine by *Bacterium coli*. III. Optic specificity of cysteinase. P. DESNUELLE (Enzymologia, 1939, 6, 387—391; cf. A., 1939, III, 721).—The cysteinase produced by *B. coli* grown anaërobically in presence of cysteine will hydrolyse only the *l*-isomeride of cysteine. E. M. W.

Cellular elements and hæmoglobin in blood of chickens experimentally infected with *Capillaria columbae* (Rud.). C. OLSON and P. P. LEVINE (Poultry Sci., 1939, 18, 3—7).—Leucocytosis of the heterophils and eosinophils and a slight anæmia occurred in infected birds during the period when clinical symptoms were apparent. A. G. P.

Routine laboratory examinations for *C. diphtheriae*. C. A. PERRY and E. PETRAN (J. Lab. clin. Med., 1939, 25, 71—78).—Serum-tellurite-agar plates are recommended for routine use. C. J. C. B.

Bacterial antigens. W. T. J. MORGAN and S. M. PARTRIDGE (Nature, 1939, 143, 1025—1026).—The phospholipin component of the antigenic complex of *B. dysenteriae* (Shiga) is not essential for the manifestation of antigenic properties nor for the capacity of the complex to induce the formation of hæmolytic heterophile immune-body. W. F. F.

MacConkey's and deoxycholate citrate agars for the isolation of dysentery bacilli. J. V. IRONS, S. W. BOHLS, T. DESHAZO, and L. L. HEWLETT (J. Lab. clin. Med., 1939, 25, 81—85).—Deoxycholate-citrate medium was superior to MacConkey's agar for the isolation of Flexner dysentery bacilli. Where typhoid and paratyphoid bacilli are to be sought, other and more suitable media for this purpose should be used. C. J. C. B.

New meningotoxoid. T. V. ÖZ (Science, 1939, 89, 588).—Broth culture of a strain of meningococcus for 12—15 days at 37°, followed by incubation of the resulting filtrate with formaldehyde, finally resulted in a toxoid which on injection into rabbits produced serum antibodies. W. F. F.

Effect of carotenoids on the growth and acid-fastness of the paratubercle bacillus of timothy grass. E. DARZINS (Ann. Inst. Pasteur, 1939, 63, 455—461; cf. A., 1939, III, 336).—Pigment production in cultures of the bacillus occurs at room temp. but not at 37° and is favoured by addition of olive oil but inhibited by treatment with pine oil vapour. β -Carotene and the pigments of egg-yolk

inhibit the growth and increase the acid-fastness of the bacillus. When the bacillus is so propagated that pigment production is decreased, loss of acid-fastness occurs but this is restored by propagation so as to permit pigment production. Increase in acid-fastness, which results from increase in m.p. of the fats present, is accompanied by increase in resistance to heat, acid, and dil. alkali. Carotene is not indispensable to the growth of acid-fast bacilli.

W. McC.

Passive immunity in experimental pertussis. E. A. NORTH, E. V. KEOGH, G. ANDERSON, and S. WILLIAMS (Austral. J. Exp. Biol., 1939, 17, 275—284).—Methods for the demonstration of antibody protecting mice against infection with *H. pertussis* are described. This protective antibody is present in the serum of some adult contacts of whooping cough, of children convalescent from whooping cough, of children immunised with *H. pertussis* (phase I), and of rabbits immunised with living cultures, both virulent (phase I) and avirulent (phase II). It is not detectable in the serum of healthy adults or of children who have not had whooping cough and have not been immunised. It is anti-bacterial in its action. There is no correlation between phase I agglutinin titre and the protective potency of sera.

D. M. N.

Prophylactic vaccination against whooping cough. J. H. LAPIN, P. COHEN, and M. WEICHSEL (Arch. Pediat., 1939, 56, 590—598).—There was a considerable response in complement-fixing antibodies one week after the first injection and a max. response one week after the last injection of 80 billion *pertussis* bacilli administered in 3 weekly doses. Almost all the sera examined were still positive 4 weeks after the injections; most were negative 4 months after vaccination. Toxin vaccine (Mishulow's) gave a more marked and more prolonged complement-fixation reaction than Sauer's vaccine. The attack rate of children injected prophylactically in proper dosage with either Sauer's or Mishulow's vaccine was smaller than in control cases. The communicability rate among the vaccinated children exposed to whooping cough was also much lower than for the control group. The disease among the children who contracted whooping cough in spite of inoculations was milder than in the controls.

C. J. C. B.

Effect of the sugar-lipin antigen of Shiga's bacillus on the bactericidal power of fresh rabbit serum. P. THIBAUT (Ann. Inst. Pasteur, 1939, 63, 462—484; cf. Ward, J. Exp. Med., 1930, 51, 675, 685).—The bactericidal action of the fresh serum and defibrinated blood of the rabbit on Shiga's bacillus is specifically inhibited (no inhibition of the action on dysentery, typhus, and paratyphus bacilli) by the sugar-lipin antigen of the bacillus but the quantity of antigen necessary for the inhibition varies from rabbit to rabbit and, for the serum or defibrinated blood of the same rabbit, from time to time. The polysaccharide of the antigen has no inhibitory power. The resistance of various strains of the bacillus to the action of serum is independent of their antigen content, which in the case of the *R* strains is 0. The action of the serum on these strains is not inhibited by the

antigen; in this respect these strains behave like bacilli of a different species. The action of the antigen is neutralised by an appropriate amount of anti-antigenic sugar-lipin serum: no neutralisation occurs if larger or small amounts are used. When excess of antibody is present the inhibition of bactericidal power is non-sp. (actions of Flexner's and paratyphus bacillus *A* also inhibited). The inhibition is not due to fixation of alexin.

W. McC.

Staphylococcus ambotoxoid. L. E. ANDERSON (Arch. Dermatol. Syphilol., 1939, 40, 382—385).—A toxoid prepared from multiple strains of staphylococci and toxoid combined with a bacterial antigen were used in the treatment of patients with acne vulgaris, furunculosis, and other dermatoses resistant to the usual therapeutic measures. 31% of the entire group of 86 courses produced moderate or decided improvement or cure. The best response (50% satisfactory) was secured in furunculosis. Serologically, 71% of 38 patients showed an increase in staphylococcus antitoxin titre. The clinical response did not parallel the serological response. All but 4 of the 86 courses produced a varying amount of local reaction at the site of injection. Among 1035 injections, no serious reactions were encountered.

C. J. C. B.

Microbic dissociation of lactic acid streptococci. O. OKULITCH (Canad. J. Res., 1939, 17, C, 171—177).—Dissociation of *S. lactis* and *S. cremoris* occurs in media containing glucose and is influenced by the presence of LiCl or phenol. The change of *S* to *R* forms is accompanied by loss of lactose-fermenting power. The organism must be in a susceptible condition before dissociation can occur.

A. G. P.

Laughlen test in diagnosis of syphilis. W. F. LEVER and W. K. MASSIE (Arch. Dermatol. Syphilol., 1939, 40, 45—52).—A series of 780 Laughlen tests have been compared with the Hinton, the rapid Hinton, the Wassermann, and the Kahn test. The Laughlen test was easy and rapid. The sensitivity and specificity of the Laughlen test warrant its use as an emergency test in preference to any other test performed on this series. The Laughlen test was less sensitive but more sp. than the rapid Hinton and less sp. but more sensitive than the Kahn test.

C. J. C. B.

Active concentration of reagents in Wassermann tests. C. BESTA (Boll. Soc. ital. Biol. sperim., 1939, 14, 474—476).—The Wassermann test result with serum or c.s.f. depends on the amount of serum or fluid used.

F. O. H.

Rapid technique for syphilis testing with finger blood. P. L. KIRK and C. BENNETT (J. Lab. clin. Med., 1939, 25, 86—88).—A modified Laughlen test is described.

C. J. C. B.

Study of 1852 chest roentgenograms of tuberculous contacts under age of 5 years. [Relation to results of Mantoux test.] H. A. ROSENBERG and M. I. LEVINE (J. Pediat., 1939, 15, 224—229).—Among 379 cases with negative Mantoux tests, the incidence of tracheobronchial shadows alone or of parenchymal shadows was 6.8%. Among 205 cases

with positive Mantoux tests, the incidence of tracheobronchial shadows alone was 9.2%, of parenchymal shadows 40%. Increased tracheobronchial shadows persisted more than 3 months in 26% of the negative Mantoux cases, as against 71% of the tuberculin-positive cases. Parenchymal shadows persisted on subsequent examination for 3 months or more in 8 of 16 (50%) of the negative Mantoux cases, and in 61 of 66 (92%) of positive tuberculin cases. Infants dying of tuberculosis generally show parenchymal shadows on a roentgenographic film. Increased tracheobronchial shadows in infancy may not be accepted as pathognomonic of tuberculosis, even in the presence of a positive Mantoux test. However, a great majority of the parenchymal lesions in tuberculin-positive infants are probably tuberculous in nature.

C. J. C. B.

Effect of methyl *p*-hydroxybenzoate on tubercle bacilli. M. A. BRACCESI (Boll. Soc. ital. Biol. sperim., 1939, 14, 508—510).—The ester has little effect on common moulds in Petragnani's medium; the growth of strains of human and bovine tubercle bacilli in the same medium is restricted by 0.1—0.15% of the ester, but avian strains are more resistant.

F. O. H.

Cutaneous test for tuberculosis in primates. M. A. KENNARD, C. R. SCHROEDER, J. D. TRASK, and J. R. PAUL (Science, 1939, 89, 442—443).—Periorbital subcutaneous inoculation of 1 mg. of old tuberculin is a test of presence or absence of tuberculosis in monkeys with approx. 90% success.

W. F. F.

Evaluation of tubercle bacillus concentration methods of Petroff, Pottenger, and chemical flocculation. A. H. NAGY (J. Lab. clin. Med., 1939, 25, 67—71).—Pottenger's dilution-flotation method of concn. gives 33 times as many bacilli as in direct smears of choice particles in routine work. The efficiency of this method is twice that of chemical flocculation and 4 times that of Petroff's.

C. J. C. B.

Existence of a non-protein somatic antigen common to the smooth and rough varieties of *Salmonella*. A. BOIVIN (Compt. rend., 1939, 209, 494—496; cf. A., 1938, III, 852; 1939, III, 796).—The "rough" typhoid bacillus is treated with trichloroacetic acid, and the centrifugate is dialysed and pptd. with 5—6 vols. of acetone. The ppt. is protein-free, on hydrolysis yields sugars and fatty acids, and when injected into rabbits produces antibodies (*R*) different from the *H*, *O*, and *Vi* antibodies of the typhoid bacillus. The same antigen mixed with *O* and *Vi* is found in the centrifugate of trichloroacetic extracts of the "smooth" typhoid bacillus. The antigen is not present in *B. coli* or Shiga's or Flexner's bacilli. The production of *R* antibodies does not confer immunity on mice.

J. L. D.

Nature of bacteriophage. Z. V. JERMOLIEVA and E. I. BELJAEVA (Microbe Variability Conf., 1936, 285—291).—Coli- and dysentery-phage are extracted by ether from their broth culture media. The dissolved phage retains its activity indefinitely, but the residue remaining after evaporation of the solvent is inactivated after 7 months of storage. The residue

H (A., III.)

consists of lipins and reducing and non-reducing carbohydrates. Bacteriophage activity is associated exclusively with the carbohydrate fraction, which is absent from ether extracts of culture medium or of bacterial cultures. The evidence is not consistent with the view that phages are living organisms.

R. T.

Physical chemistry of bacteriophage and of bacteriophage lysis. M. N. FISCHER (Microbe Variability Conf., 1936, 293—310).—Krueger and Northrop's kinetic laws of reproduction of phage, its adsorption on living and dead bacteria, and of bacteriolysis (A., 1931, 126) were found to apply to paratyphoid-*B* phage grown in synthetic media. A consideration of the physical and chemical properties of phage leads to the conclusion that it is of protein nature, and is a living organism.

R. T.

Bacteriophagy in putrefaction of potatoes. K. I. BELTJUKOVA (Microbe Variability Conf., 1936, 433—442).—A no. of bacteriophages were isolated from rotting potatoes, from soil, and from cultures of certain plant saprophytes and pathogens. The p_H limits of lysis of spore-forming bacteria are wider than for non-sporiferous bacteria. The phages are rapidly inactivated by sunlight. They withstand desiccation and storage at 30° for over 3 months, and retain their activity after 2 years in Gottinger broth.

R. T.

Bacteriophage in the sporiferous gas-producing *B. saccharolyticus* (n. sp.). L. A. LIBERMAN (Microbe Variability Conf., 1936, 443—457).—A phage sp. for *B. saccharolyticus* is described. It develops at 37° and 50° (p_H 5—8.5) in ordinary cultures, as well as in cultures of bacteria grown from spores heated at 90° for 30 min. Coccoid forms often appeared in phage-containing cultures; these reverted to the normal bacillar form when inoculated into broth.

R. T.

Specificity of bacteriophages, and bacteriophage carriers. Z. P. NARISCHKINA (Microbe Variability Conf., 1936, 475—482).—40% of the phages isolated from dysentery patients or convalescents were sp. for the Shiga-His-Flexner group, and may be removed from solution by adsorption on the killed sp. bacteria. Multivalent phages probably consist of two or more sp. phages. 30% of healthy subjects examined were found to carry dysentery phage; during an epidemic the no. of phage carriers rose to 60%.

R. T.

Infection and immunity virus diseases: general considerations. J. A. TOOMEY (J. Pediat., 1939, 15, 426—431).—A crit. review. C. J. C. B.

Virus activity as a property of some protein molecules. R. J. BEST (J. Austral. Inst. Agric. Sci., 1939, 5, 94—102).—A lecture. A. G. P.

Poliomyelitis. I. Intraocular inoculation as standard method for demonstration of neutralising antibodies. F. M. BURNET, A. V. JACKSON, and E. G. ROBERTSON. **II. Significance of neutralising antibodies in human sera.** F. M. BURNET and A. V. JACKSON (Austral. J. Exp. Biol., 1939, 17, 253—260, 261—270).—I. Rhesus monkeys are very susceptible to poliomyelitis virus (M. V. strain) by

intraocular injection. The first symptom is usually a bilateral ptosis. In the pathological histology, intense changes in the region of the oculomotor nuclei are the most characteristic features. Antibody titrations can be conveniently carried out by the intraocular route and give higher titres and more regular results than the intracerebral procedure.

II. Sera from poliomyelitis patients taken at the acute stage showed no significant difference in antibody titre from sera obtained from the same patients 2 or 3 months later. Similar tests of 1st and 2nd bleeds from brother and sister contacts of poliomyelitis cases showed no appearance of antibody between the two bleeds. 5 patients possessed active circulating antibody at the time of acute illness. "Poliomyelitis antibody" is not a result of exposure to or infection by the virus of epidemic poliomyelitis.

D. M. N.

Transmission of lymphocytic choriomeningitis by mosquitoes. L. T. COGGESHALL (Science, 1939, 89, 515—516).—The virus of lymphocytic choriomeningitis in guinea-pigs following a bite by infected mosquitoes was identified by a sp. immunity. The virus was neutralised by known immune guinea-pig and monkey sera.

W. F. F.

Intermediate host for swine influenza virus. R. E. SHOPE (Science, 1939, 89, 441—442).—Lungworm larvæ from pigs with swine influenza harbour swine influenza virus throughout their development in their intermediate host, in the earthworm, and in their definitive host, the swine. The virus lies latent in the lungworm and is liberated only when a suitable stimulus is applied. A single intrapleural injection of CaCl_2 solution has provoked the influenza virus infection.

W. F. F.

Hog cholera immunisation in pigs on low vitamin-B-complex intake. E. H. HUGHES and H. S. CAMERON (J. Amer. Vet. Med. Assoc., 1939, 95, 106—107).—Deficiency of vitamin-B complex in the diet of five young pigs did not affect the immunity conferred by vaccination against swine fever.

E. G. W.

Hog-cholera virus. J. ZICHIS (J. Amer. Vet. Med. Assoc., 1939, 95, 272—277).—Hog-cholera virus was transmitted to sheep both by intravenous injection and by cohabitation with infected animals. No symptoms developed but blood from such sheep was pathogenic for pigs for at least 21 days after infection. Such infected sheep transmitted the virus to a pig by cohabitation. The virus was successfully passed through a series of ten sheep, but after passage through a further sheep was no longer virulent for pigs. It is clear that swine fever virus can, therefore, multiply within sheep. The blood of a calf injected intravenously with hog cholera virus was infective for pigs for at least 3 days. Hyperimmune serum could not be produced in sheep or in a calf by repeated injections of virus nor could neutralising antibodies be detected in the blood.

E. G. W.

Effects of heat on phenolised hog-cholera virus. J. D. RAY and G. E. WHIPPLE (J. Amer. Vet. Med. Assoc., 1939, 95, 278—282).—Swine fever virus to which 0.5% of phenol was added was sub-

jected to varying degrees of heating and the effects were studied by the inoculation of the heated and unheated virus in susceptible pigs. In some experiments, heating conferred on the phenolised virus the properties of a vaccine which successfully protected pigs against a dose of living virus. Conditions of temp. similar to those in the luggage compartment of a car during warm weather were found in some cases to kill the virus. Susceptibility of individual pigs to the injection of heated virus varied.

E. G. W.

Cultivation of rabies virus in the developing chick embryo. I. J. KLIGLER and H. BERKOPF (Nature, 1939, 143, 899—900).—Embryos of 5—6 days old are readily infected and serial passages can be maintained.

W. F. F.

Demonstration of rabies virus in grossly decomposed animal brains. S. E. SULKIN and N. NAGLE (J. Lab. clin. Med., 1939, 25, 94—98).—Ether in final concn. of 10% exerts a definite bactericidal effect on contaminated dog brains after exposure for 2 hr. at 4°. Exposure to this concn. of ether for 18 hr. at 4° had no effect on the virulence of 2 strains of street virus tested.

C. J. C. B.

Diminution of the antigenic power of the murine typhus virus (guinea-pig) after passage through mice. P. GIROUD and R. PANTHER (Compt. rend. Soc. Biol., 1939, 131, 987—988).—Passage through mice causes a loss wholly of the antigenic power towards the classical typhus and partly of the antigenic power towards murine typhus as shown by inoculation into guinea-pigs.

H. G. R.

Chemical composition of molluscum contagiosum inclusion body. C. E. VAN ROOYEN (J. Path. Bact., 1939, 49, 345—349).—Tests with Lugol's I indicate that the envelope is mainly composed of carbohydrate which can be largely removed by preliminary digestion with fresh human saliva but not by boiled saliva. (6 photomicrographs.)

C. J. C. B.

Biochemical changes in oats affected with virus disease. V. L. RISHKOV, M. N. VOROBEVA, and E. P. GROMIKO (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 301—303).—Oat leaves infected with virus do not show any significant changes in N content but in dwarfs, total N increases whilst protein-N decreases. The amounts of reducing and non-reducing sugars and starch are increased. P metabolism of oat leaves is greatly affected by the disease; lipin-P decreases whilst acid-sol. P increases. The decrease in lipin-P appears to be related to the reduction and disintegration of plastids which occurs in diseased plants. The classification of the disease is discussed.

J. N. A.

Myzus ornatus a vector of potato viruses. J. B. LOUGHNANE (Nature, 1939, 144, 785—786).—*M. ornatus* is a vector of potato virus, and probably of viruses of other crops.

L. S. T.

Biotin. W. J. ROBBINS and M. B. SCHMIDT (Bull. Torrey Bot. Club, 1939, 66, 139—150).—A method of determining biotin by growth of *Ashlya gossypii* is described. Biotin contents of liquid manure, cerophyll, egg-yolk, etc. are recorded.

Neither pantothenic acid nor vitamin- B_6 can replace biotin. Biotin in raw sugar-cane syrup is progressively removed in the successive stages of purification of the sucrose. A. G. P.

Use of incubating egg as a differential medium. H. J. METZGER, F. R. BEAUDETTE, and F. R. STOKES (J. Amer. Vet. Med. Assoc., 1939, 95, 158).—The effects of inoculating the chorio-allantois of eggs at the tenth day of incubation with cultures of *Brucella abortus* and *Streptococcus agalactiae* are described. The bactericidal activity of the chick embryo was sufficient to destroy approx. 50,000 *S. agalactiae*, and *Br. abortus* was then isolated from the embryo in pure culture. Similar results were obtained with milk containing both organisms and the method is suggested as a rapid procedure for isolating *Br. abortus* from milk, which is commonly infected with *S. agalactiae*. E. G. W.

Preparation of silicic acid substrates for microbiological use. S. HJORTH-HANSEN (Compt. rend. Trav. Lab. Carlsberg, 1939, Sér. physiol., 22, 417—425).— $2N-Na_2SiO_3 \cdot 8H_2O$ is adjusted to p_H 5.5 by appropriate addition of $2N-HCl$. The plated material sets in 10 min., after which it is freed from $NaCl$ and impregnated with the desired nutrients by successively soaking in water and in the nutrient medium. The sterilised and dried gel is inoculated by pouring a dil. suspension of yeast or of mould spores over the surface. The utility of the medium for such organisms is shown; it is especially useful in growth factor experiments since the Na_2SiO_3 contributes no org. material. I. A. P.

Culture tube for more rapid diagnosis. I. S. BARKSDALE (J. Lab. clin. Med., 1939, 25, 79—81).—The principal advantages of the new vial type Loeffler culture tube are due to a large amount of nose and throat secretion inoculated into a small amount of culture media, the bacteria of which have multiplied in sufficient nos. to enable accurate bacteriological diagnosis in 3—4 hr. C. J. C. B.

Infectious diseases. H. A. REIMANN (Arch. intern. Med., 1939, 64, 362—405).—A review. C. A. K.

Mouse brain antigen. D. A. DECKER, O. CANIZARES, and R. F. REIDER (Arch. Dermatol. Syphilol., 1939, 40, 397—401).—Among patients with lymphogranuloma venereum 1 of 10 gave a positive reaction to the intravenous injection of 0.001 c.c. of mouse brain antigen; 4 of 9 gave a positive and 2 a doubtful reaction to 0.01 c.c. and 51 of 56 gave a positive and 5 a doubtful reaction to 0.1 c.c. Among controls, 1 of 25 gave a doubtful reaction to the intravenous injection of 0.001 c.c. of mouse brain antigen; 1 of 25 gave a positive reaction to 0.01 c.c. and 5 of 70 gave a doubtful reaction to 0.1 c.c. The intravenous injection of 0.1 c.c. of a saline suspension of normal mouse brain emulsion did not produce either a positive or a doubtful reaction in any subject. C. J. C. B.

Adsorption of antibodies by egg-albumin films. A. ROTHEN and K. LANDSTEINER (Science, 1939, 90, 65—66).—Data are presented on film thickness and immunological reaction. W. F. F.

Prophylactic use of parental serum against contagion in a pediatric ward. L. H. BARENBERG, D. GREENE, and M. J. H. GRAND (Amer. J. Dis. Child., 1938, 57, 322—329).—Each child admitted to the medical pediatric ward received 20 to 30 c.c. of parental blood serum. This serum was readily absorbed without any untoward effects. The surgical ward served as a control, since serum was not used there. There were no outbreaks of measles, scarlet fever, or diphtheria in the medical wards since use of the serum, while there were 12 outbreaks in the surgical wards during that period and 13 outbreaks in the medical wards for the 4 years preceding the use of serum. C. J. C. B.

Zone reactions in the Kline test. R. A. GREENE and E. L. BREAZEALE (J. Lab. clin. Med., 1939, 25, 104—105).—Sera which gave strongly positive Kahn and weakly positive Kline reactions showed a zone effect when the serum was diluted with saline. In general, such sera, when diluted 1:1 or 1:2, gave Kline reactions which compared with the Kahn reactions with undiluted sera. The incidence of these sera is not great (1 per 1000). C. J. C. B.

Synthetic immunochemistry. IV. Further investigation of O - β -glucosidotyrosyl derivatives of proteins. J. H. HUMPHREY and M. E. YUILL (Biochem. J., 1939, 33, 1826—1832).—The prep. of the O - β -glucosido- N -carbobenzyloxytyrosyl derivative of rabbit serum-protein and N -carbobenzyloxytyrosyl derivative of gelatin is described. The immunological properties of these and similar compounds observed by Clutton *et al.* (A., 1938, III, 854) have been confirmed, although it seems that the carbobenzyloxy-group is antigenically significant, and a hapten function must be assumed for it. The insulin derivative probably stimulates the formation of sp. pptg. antibodies. P. G. M.

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Activity of growth processes. Principal factor in frost-resistance of citrus plants. S. M. IVANOV (Compt. rend. Acad. Sci. U.R.S.S., 1939, 22, 277—281).—Frost-resistance in citrus varieties is largely dependent on the ability of plasma colloids to withstand low-temp. coagulation, which is, in turn, a function of the growth activity of the cells. The proportion of reduced glutathione present is a measure of growth activity and therefore of frost-resistance. A. G. P.

Effect of temperature on the reversible activity of invertase in forage grasses as dependent on their cold- and heat-resistance. A. S. MOROZOV (Compt. rend. Acad. Sci., U.R.S.S., 1939, 23, 949—951).—The synthesising and hydrolysing activity of invertase has been studied at intervals of 10° from -5° to 50° in hibernating leaves of *Bromus inermis* and of *Lolium perenne* taken from under the snow. Depending on the osmotic pressure the cells are infiltrated with 0.1—0.2M-sucrose for determinations of hydrolysis and of invert sugar for determination of synthesis. After infiltration the plants are kept for 3 hr. at the corresponding temp. In *B. inermis* the temp. max. are shifted towards low temp.; this

is particularly noticeable in plants which have been temp.-hardened. The hydrolysing action of invertase suggests three max. at -5° , 10° , and 50° respectively and the synthetic action has max. at -5° and 20° . At low temp. synthesis prevails markedly over hydrolysis. At -12° the leaves are iced and there is neither synthesis nor hydrolysis. An entirely analogous situation is observed in hibernating leaves of *L. perenne*. In the leaves of *L. perenne* grown under greenhouse conditions the temp. max. are shifted towards high temp. The hydrolysing action of invertase has two max. at 30° and 50° respectively and the synthesising action has max. at 20° and 30° . The cold max. is more strongly expressed in those plants which have been temp.-hardened. The ratio synthesis/hydrolysis permits judgment of the adaptability of plant cell to high and low temp.

H. W.

Root composition and top development in large pecan trees headed to various degrees of severity in top working. C. L. SMITH, J. HAMILTON, C. J. B. THOR, and L. D. ROMBERG (J. Agric. Res., 1939, 58, 821—842).—The % of dry matter in pecan roots was greater in summer and autumn than in winter and spring. Fluctuations were smaller in trees cut back to stumps or to one fork than in those cut to two or more forks or left untouched. The starch content increased steadily from a min. in summer to a max. in winter and subsequently declined. The high autumn vals. were suppressed by heavy cropping. Cutting back the trees lowered the starch content proportionally to the decrease in total leaf area. Variations in non-reducing sugar contents followed those of starch; reducing sugar vals. were low throughout. Fluctuations in hemicelluloses were small. The % of N in roots was greatest in trees cut back to stumps; fluctuations were independent of those in dry matter content.

A. G. P.

Physiological ontogeny in the tobacco plant. II. Drifts in water content of leaves in relation to phosphorus supply and topping. R. WATSON (Austral. J. Exp. Biol., 1939, 17, 241—251).—High P supply increased and topping in general decreased the % water content.

D. M. N.

Effects of nutrition on the initiation of hereditary changes. H. STUBBE (Angew. Chem., 1939, 52, 599—602).—The effects of P, N, and S deficiencies in increasing the % of mutations are discussed, with particular reference to results obtained with *Antirrhinum majus*.

J. W. S.

(A) Effect of ions of aluminium and phosphoric acid on biological properties of plant protoplasm. (B) Ionic action as a means of controlling [frost]-resistance and growth of plants. L. I. SERGEEV and K. A. SERGEEVA (Compt. rend. Acad. Sci. U.R.S.S., 1939, 22, 626—629, 630—632).—(A) Al^{+++} increases the viscosity and decreases the permeability of protoplasm, and also decreases the % of water in tissues of wheat seedlings. PO_4^{---} has the opposite effect in each case.

(B) Al^{+++} promotes resistance to frost but decreases growth of plants. PO_4^{---} promotes growth and decreases resistance.

E. M. W.

Transport in the cotton plant. VII. Simultaneous changes in the production and distribution of dry matter under varying potassium supply. E. PHILLIS and T. G. MASON (Ann. Bot., 1939, 3, 889—899; cf. A., 1937, III, 46).—Correlation is established between the total dry wt. and distribution of dry wt. (rest of plant/leaf lamina) at all levels of K supply. No such relationship holds for different levels of N. A relationship is postulated between rate of photosynthesis and rate of transport from assimilating cells to phloem. K controls photosynthesis by altering the rate of diffusion of CO_2 into chloroplasts and also the translocation of sugar by its influence on the rate of diffusion through the protoplasm of the parenchyma.

A. G. P.

Mechanism of ripening in bananas. K. WÜLFERT (Biochem. Z., 1939, 302, 232—246).—During ripening (conversion of starch into sugar), the acidity of bananas, measured with the glass electrode, increases slightly (p_H change from approx. 5.3 to approx. 4.5) and the rate of CO_2 production of unpeeled bananas first increases slightly (max. on 3rd or 4th day) and then decreases during approx. 2 days, remaining const. thereafter. In an atm. of N_2 slight CO_2 production occurs but no ripening. When the peel is removed, CO_2 production by sterile bananas is slight and no ripening occurs. Aërated suspensions of banana with peel, rendered sterile by addition of bactericide, produce little CO_2 and do not ripen. Probably ripening occurs only when peel is so attached to flesh that the O_2 required for ripening does not come in contact with the flesh. Press-juice from green bananas has no effect on aërated banana- or other starch.

W. McC.

Refilling period of fruit development in the pecan. C. J. B. THOR and C. L. SMITH (J. Agric. Res., 1939, 58, 905—910; cf. A., 1935, 904).—Variations in dry matter, ash, sugar, and acid-hydrolysable polysaccharide contents of shuck, shell, and kernel are observed through the refilling period.

A. G. P.

Excretion of nitrogenous substances from root nodules; observations on various leguminous plants. G. BOND and J. BOYES (Ann. Bot., 1939, 3, 901—914).—No evidence of the excretion of N from roots of legumes was obtained. Positive results recorded by other workers are discussed.

A. G. P.

Value of plasmolytic methods in demonstrating active asparagine intake of *Vallisneria* leaves. W. H. ARISZ and P. J. VAN DIJK (Proc. K. Akad. Wetensch. Amsterdam, 1939, 42, 820—831).—Intake of asparagine by the leaves (cf. A., 1938, III, 965) causes increased osmotic pressure in the cells, much of the asparagine remaining unchanged in the cell sap. Addition of sugar to the asparagine solution in amounts sufficient to cause plasmolysis markedly restricts the intake. Intake of glycerol occurs from solutions sufficiently conc. to cause plasmolysis and is independent of the presence of O_2 . Distinction is drawn between "active permeation," e.g., of asparagine, which requires O_2 and "passive permeation," e.g., of glycerol, which is independent of O_2 . High osmotic concns. restrict active but not passive permeation.

A. G. P.

Ammonium and nitrate supplies: effect on biochemical processes in leaves of *Nicotiana rustica*. A. V. VLADIMIROV (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 699—702).—Leaves from plants supplied with $(\text{NH}_4)_2\text{SO}_4$ contain less sugar, org. acids, and protein-N, and more sol. N and nicotine, than those supplied with NO_3^- . Increase of N supply causes a decrease in sugar and an increase in protein-N and nicotine content in each case.

E. M. W.

Effect of variation in nitrogen supply and water content on amounts of carbohydrates in leaves of grass plants. G. L. AMOS and J. G. WOOD (Austral. J. Exp. Biol., 1939, 17, 285—320).—Plants of *Lolium subulatum* growing in otherwise identical environments were treated with three different $(\text{NH}_4)_2\text{SO}_4$ concns. under two different light intensities. Total org. N increases in amount with the first application of NH_4 salts, but changes little with subsequent additions. Sucrose, fructosan, hemicellulose, and starch decrease as the org. N increases. When the water content of the leaves is low, no change in total carbohydrate occurs, but the amounts of fructosan and sucrose increase while the amounts of hemicellulose and possibly starch decrease. The concn. of sucrose is determined by that of glucose and fructosan; hemicellulose content is determined by the glucose and water content. The rate of respiration is possibly determined by the sucrose and amino-N concns.

D. M. N.

Carbohydrate storage by forage grasses. A. S. MOROZOV (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 407—409).—The reserve carbohydrates of forage grasses are mainly hemicellulose and inulin-like substances, and they are deposited in the roots, rhizomes, stems, etc. The max. carbohydrate content occurs at the flowering period. Vals. are given for the different carbohydrate fractions of *Bromus inermis*, Leyss., *Lolium perenne*, and *Festuca pratense* at the tillering, flowering, and fruiting periods. Sucrose always predominates over monosaccharides.

P. G. M.

Rôle of leaves in the storage of starch by potato tubers as determined by their position on the plant. V. P. NILOVA (Compt. rend. Acad. Sci. U.R.S.S., 1939, 22, 633—636).—In a flowering potato plant the hydrolytic activity of the invertase exceeds synthetic activity in the middle leaves; synthesis predominates in the upper leaves. Removal of upper and lower leaves causes an increase, and that of middle leaves a decrease, in the starch content of the tubers.

E. M. W.

Variations in colour of the pods and seeds of haricot beans. L. DANIEL (Compt. rend., 1939, 209, 499—501).—After a storm the damaged leaves become yellow and the pods etiolated. This condition was aggravated by the plants being water-laden and in a humid atm. so that transpiration and access of light were greatly impaired. Coincidentally most of the seeds perished but those which survived were larger than normal because of the additional food material available for them. Those portions which rotted grew moulds, the underlying seeds being altered

in colour. The starch reserves were converted into dextrin; the pods became soft and bent.

J. L. D.

Chlorophyll fluorescence and assimilation of carbonic acid. VIII. H. KAUTSKY and R. EBERLEIN (Biochem. Z., 1939, 302, 137—166; cf. A., 1937, III, 240, 444; 1938, III, 1063).—Improvements in the apparatus enable it to record very small, rapid changes in intensity of fluorescence. Examination of curves showing the effects of change in temp. and in O_2 concn. on the relation between duration of illumination and intensity of fluorescence in *Ulva lactuca* reveals great differences in the rate at which the effects develop. The chloroplast contains a dissociable O compound, AO_2 , which extinguishes the fluorescence. This compound acquires one quantum of energy from stimulated chlorophyll and is converted into a substance, AO_2^c , which does not extinguish fluorescence. The increase in intensity of fluorescence which accompanies these changes is independent of temp. change. When illumination begins, a decrease in the intensity of fluorescence occurs and the extent of the decrease depends on the temp. This change results from the absorption of one quantum of light by a complex KAO_2^c with liberation of AO_2 or of $A + \text{O}_2$. After max. intensity of fluorescence has been attained a second decrease occurs. This decrease, the extent of which depends on temp., results from the conversion, by an unknown substance, of AO_2^c (which is not sensitive to light) into KAO_2^c . Thus a cycle is set up in which at least 2 quanta of energy are consumed but no matter is gained or lost. In the chloroplast of green plants this cycle occurs generally.

W. McC.

***Streptocarpus*. I. Genetics and chemistry of flower colour in garden strains.** W. J. C. LAWRENCE, R. SCOTT-MONCRIEFF, and V. C. STURGES (J. Genetics, 1939, 38, 299—306).—Chromosome counts, flower colours, and the nature of the pigments are examined. Of the flower colour genes *A* is necessary for the production of anthocyanins, being associated, when alone, with pelargonidin or in presence of *R* with cyanidin derivatives. *O* is epistatic to *R* and in presence of *A* gives delphinidin derivatives. *D* produces 3:5-dimonoside in place of pentoseglycoside-dimonoside (*d*) mixtures. Seven colours result from combinations of these genes. Methylation is complete with delphinidin but not with cyanidin derivatives.

A. G. P.

Genetics of cyanogenesis in white clover (*Trifolium repens*). R. D. WILLIAMS (J. Genetics, 1939, 38, 357—365).—The presence or absence of cyanoglucoside in white clover is determined by a simple pair of factors. The cyanophoric character is substantially completely dominant to the acyanophoric. Differences in HCN content of plants within the same family or between different families are probably due to modifying factors.

A. G. P.

Genetics of the phenol colour reaction in wheat. K. MICZYŃSKI, jun. (Z. Zuchtung, 1938, A, 22, 564—587).—Relations between genetic factors and phenol coloration of grain and husk are examined. The phenol coloration of the husk is dependent on the oxidase content.

A. G. P.

Breeding red-fruited and red-fleshed varieties of apple. Inheritance of anthocyanin coloration in apple tree. P. D. TREBUSHENKO (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 939—943).—The anthocyanin coloration of all the organs of the apple-tree (particularly prominent in the young tissues) depends on two dominant factors, *F* and *M*. The factor *F* (fundamentum) is the leuco-base of the anthocyanin coloration; other factors produce no coloration in its absence. The factor *M* (movimentum) causes formation of anthocyanin coloration in co-operation with *F*. Without *F*, *M* produces no colour. *M. floribunda purpurea*, Barbier, *M. purpurea eleyi*, Rehd., *M. purp. aldenhamensis*, Rehd., and "Melo japonese" have identical factorial composition *FfMm* with regard to anthocyanin colour. Forms and varieties devoid of anthocyanin coloration may be: homozygous for the two recessive factors *ffmm*, heterozygous for the factor *F* of the composition *Ffmm*, homozygous for the factor *F* of the composition *FFmm*. No forms or varieties of apple-trees devoid of coloration and possessing the factor *M* have been discovered. For preliminary factorial analysis for anthocyanin coloration in apple tree against the background of the complete recessive a min. no. of seedlings may be as low as 32, i.e., twice the no. of possible combinations of gametes. H. W.

Grafting as a method of changing alkaloid content in plants. B. S. MOSCHKOV and M. I. SMIRNOVA (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 88—90).—The alkaloid content of the leaves and seeds of lupin scions is influenced by the nature of the stock on which they are grafted, the change being such that the content of the scion approaches that of the stock. W. O. K.

Tropical fruits. VI. Solubility of gases in relation to respiration. E. R. LEONARD. **VII. Banana fruits in relation to studies in metabolism.** C. W. WARDLAW, E. R. LEONARD, and H. R. BARNELL (Ann. Bot., 1939, 3, 825—843, 845—860; cf. A., 1939, III, 801).—VI. The solubility of O₂, CO₂, and N₂ in water and in aq. solutions of carbohydrates at varying total and partial pressures is examined in relation to respiratory exchanges within the fruit.

VII. Relationships between the wt. per finger, wt. per bunch, and skin/pulp ratio of bananas in different stages of maturity selected for commercial harvesting are examined. A. G. P.

Oxygen regulates dormancy of the potato. N. C. THORNTON (Contr. Boyce Thompson Inst., 1939, 10, 339—361).—Ready access of bud tissue to O₂ retards sprouting. Skins of tubers become less permeable to O₂ with increasing age. Cutting of dormant tubers temporarily retards sprouting until the rapidly developing "wound" cork tissue covers the wound. Subsequently sprouting is accelerated since the corky tissue restricts access of O₂ more effectively than does the normal periderm. Diminution in [O₂] of storage atm. hastens sprouting. A. G. P.

Inhibition of the growth of buds of potato tubers with vapour of methyl naphthylacetate. J. D. GUTHRIE (Contr. Boyce Thompson Inst., 1939, 10,

325—328).—The ester is sufficiently volatile at 25—28° to penetrate intact tubers in the vapour form. Sprouting of tubers is thereby retarded. The ester also causes epinasty of tomato leaves when placed on filter-paper near the plant under a bell jar.

A. G. P.

Responses of plants to growth-substances applied as solutions and as vapours. P. W. ZIMMERMAN, A. E. HITCHCOCK, and F. WILCOXON (Contr. Boyce Thompson Inst., 1939, 10, 363—376).—Numerous growth-promoting substances produced similar characteristic responses in plants when applied in vapour form or in aq. solution. The "triple response" of etiolated pea seedlings to ethylene was also produced by vapours of many growth-promoting substances. A. G. P.

Pea test for auxin. F. W. WENT (Bull. Torrey Bot. Club, 1939, 66, 361—410).—The curvature of split etiolated pea stems when placed in auxin (cf. A., 1935, 131) is not due to difference in sensitivity of tissues near the intact epidermis and those bordering the wound but to loss of sensitivity of the latter tissue. If auxin is applied before loss of sensitivity has occurred no curvature results. Two stages of the test are distinguished. The preparatory reaction is independent of p_H and may be produced by substances, e.g., hemi-auxins, indole, which lack growth activity. The actual growth reaction requires a smaller concn. of auxin than does the preparatory stage. A. G. P.

Vegetative propagation of conifers. I. Rooting of cuttings from upper and lower regions of a Norway spruce tree. N. H. GRACE (Canad. J. Res., 1939, 17, C, 178—180).—Treatment of cuttings with talc containing indolylacetic acid increased the no. of roots per cutting and decreased the mean length of root. The no. of cuttings taking root was not significantly increased. Lower cuttings rooted in greater nos. and produced greater total and mean lengths of roots. A. G. P.

Effect of 3-indolylacetic and phenylacetic acid on the growth of some Saprolegniaceæ. M. S. MURDIA (Current Sci., 1939, 8, 362—363).—Less than 1 p.p.m. of β -indolyl- or phenyl-acetic acid has no effect on the growth of many of the Saprolegniaceæ. Higher concns. (up to 1 : 5000) inhibit growth.

J. L. D.

Relations between the reaction of medium and the activity growth-substances. J. V. RAKITIN and L. M. JARKOVAJA (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 952—954).—The growth reaction of *Avena* coleoptiles is considerably increased by oxalic, citric, malic, or sulphuric acid. Within the limits $p_H = 6.32$ —3.80 the intensity increases with increasing acidity in an acetate buffer and further stimulation is observed after addition of growth-substances obtained from oat kernels. H. W.

Cicatrization layer before the fall of leaves. K. I. GAVRILOV (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 726—729).—The concn. of growth-substance *B* near the cicatrization layer falls slightly and then rises rapidly before leaf-fall. E. M. W.

Dynamics of group-B growth-substances in plants. K. I. GAVRILOV (Compt. rend. Acad.

Sci. U.R.S.S., 1939, 22, 365—369).—Bios is synthesised in leaves of several plant species at rates which are relatively small during the swelling of buds, increasing with the formation of young leaflets and remaining practically const. in completely grown leaves until leaf-fall is approached. The bios content of leaves in warm sunny weather increases towards evening, reaching a max. at 4—5 a.m. and decreasing again at 2—3 p.m. Vals. are high in floral buds.

A. G. P.

Combined effect of colchicine and heteroauxin on seedlings of camphor-yielding basil. V. GLOTOV (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 400—402).—Treatment of the seeds with low concns. of colchicine (below 0.0015%), although causing an 80—90% mortality among the seedlings, yields no entirely tetraploid forms but merely a few tetraploid cells. The lethal effect of colchicine may be counteracted by planting seedlings at the cotyledon stage in sand moistened with solutions of β -indolyacetic acid. The optimum concn. of this acid, which results in 85.6% survival, is 0.00025% for 3 days where 0.0015% colchicine has been used, whilst the same concn. for 5 days produces optimal results (23.1% survival) where 0.0063% colchicine is used.

P. G. M.

Colchicine-induced tetraploidy in *Helianthus annuus*. L. V. A. RIBIN (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 368—371).—Drops of 0.05 and 0.1% solutions of colchicine are applied daily for 8 days to the tip of the stems of this sunflower; the plants flower normally and no large pollen grains are found. Immersion of the young plants in 0.05% colchicine for 24 hr. at 20—25° completely arrests growth during the following 2—3 weeks. The flowers which form are mainly deformed and many contain pollen grains 2—4 times as large as those of controls. Many seeds obtained from these abnormal flowers give rise to tetraploid seedlings.

P. G. M.

Effects of plant virus diseases on cells of their hosts. F. M. L. SHEFFIELD (J. Roy. Microscop. Soc., 1939, 59, [iii], 149—161; cf. A., 1939, III, 530).—Inclusions occurring in cells of plants infected with certain virus diseases may be cryst. or amorphous. Different types are distinguished. The shape of liquid crystal inclusions of tobacco mosaic virus is similar to that of fibres formed on acidifying the cryst. bodies of the same strain. The nucleic acid of the virus is of the ribose type. The granular bodies contain oil globules and chondriosomes as well as virus. The structure of amorphous and cryst. inclusions is discussed.

A. G. P.

(xxvii) PLANT CONSTITUENTS.

Rare-earth elements in calcareous algæ (*Lithotamnium calcareum*). M. SERVIGNE and A. TCHAKIRIAN (Compt. rend., 1939, 209, 570—572).—The ash of the algæ examined by the author's method (A., 1939, I, 509), contains concns. of Pr, Nd, and Sm of the order of 5 μ g. per 100 g.

J. L. D.

Chemistry of the plant cell wall. IX. W. M. HARLOW (Paper Trade J., 1939, 109, TAPPI Sect., 242—246).—The location of lignin, cellulose, and

other components in the cell walls of a no. of woods is studied. The layer most retentive of lignin during the delignification of wood sections is the primary wall; this is shown by its presence as a network in 72% H_2SO_4 , and at a later stage in Schweizer's reagent after the intercellular substance has been removed and when the secondary walls have completely dissolved. Primary walls may be delignified to a point at which they are completely sol. in 72% H_2SO_4 but still remain insol. in Schweizer's reagent. They may then be made sol. in the reagent by further delignification, by treatment with hemicellulose solvents, or, in some cases, with polyuronide solvents. The solubility of cell walls in Schweizer's reagent is probably a better test for the complete removal of encrusting substances, particularly lignin, than is their solubility in 72% H_2SO_4 . Treatment of wood sections of several dicotyledons with vanillin failed to cause the secondary walls of fibre tracheids to give a coherent structural pattern when subjected to 72% H_2SO_4 , even though untreated sections gave a strong Maûle colour test.

H. A. H.

Composition of the seeds of *Sapindus drummondii*. O. C. DERMER and L. T. CREWS (J. Amer. Chem. Soc., 1939, 61, 2697—2698).—The seeds of *S. drummondii*, H. and A., contain 23—24 and the seed-kernels 42.7% of ether-sol. material. The exhausted meal contains protein 21.3, crude fibre 18.0, water 8.40%, and some starch, but no reducing sugars, and gives 3.7% of ash. The oil yields on hydrolysis oleic 60—65 and linoleic acid 15%, with some palmitic and stearic acid. A hydrocarbon is also present.

R. S. C.

Sterols of lucerne seed oil. I. L. C. KING and C. D. BALL, jun. (J. Amer. Chem. Soc., 1939, 61, 2910—2912).—Lucerne seed oil contains about 4% of unsaponifiable matter, of which about 35% is a cryst. sterol closely resembling α -spinasterol.

R. S. C.

Plant phosphatides and lecithin. VI. **Phosphatide of rape.** B. BLEYER, W. DIEMAIR, and K. WEISS (Biochem. Z., 1939, 302, 167—172; cf. A., 1939, III, 951).—Lecithin (from rape) stored without exclusion of air for over a year and freed from accompanying fatty acids, consists of an ether-insol. and an ether-sol. portion containing 3.84 and 3.29% of P and 1.50 and 1.21% of N respectively. The ether-sol. portion contains carbohydrate. When this and amino-N are removed the ether-sol. residue contains P 3.32 and N 1.24%. The proportion of fatty acids (oleic and palmitic) obtained from the ether-sol. portion by acid hydrolysis is 61.5%, the ratio of solid to liquid acids being 1 : 5.25. The ratio of α - to β -glycerophosphoric acid is 3.36 : 1.

W. McC.

Quinovic acid from *Zygophyllum coccineum*. L. G. SOLIMAN (J.C.S., 1939, 1760—1761).—Quinovic acid [O-acetyl derivative, m.p. 282—284° (decomp.)], identical with an authentic specimen, has been isolated.

F. R. S.

Identification of Shih-chan-chu alkaloids. J. H. CHU (Chinese J. Physiol., 1939, 14, 315—317).—A hot alcohol extract of the powdered roots of Shih-chan-chu (*Stephania tetrandra*, Moore, Menispermaceæ)

contains tetrandrine (*picrate*, m.p. 274°) (cf. A., 1935, 873) and menisidine, m.p. 176° and again 242° after resolidifying at about 200° (cf. A., 1935, 1433).

J. L. D.

Distribution of bios in leaves of *Pueraria* and vine. J. V. RAKITIN and L. M. JARKOVAJA (Compt. rend. Acad. Sci. U.R.S.S., 1939, 22, 523—526).—The bios content of leaf parts examined decreased in the order, blade, swellings in petioles connecting lobes with main petioles, swellings at base of main petioles, main petioles, stems. In swellings at the base of petioles and in blades, vals. became very high in autumn. The increased rate of cell division associated with the formation of a separating layer at leaf fall is probably stimulated by the localised concn. of bios.

A. G. P.

Structure of barbatolic acid.—See A., 1939, II, 549.

(xxviii) APPARATUS AND ANALYTICAL METHODS.

Practical operating stand. C. S. APGAR, jun. (Science, 1939, 90, 22).—A flexible table having one central support bolted to the floor is described.

W. F. F.

Precision device for faradic stimulation. F. A. FENDER (Science, 1939, 89, 491—492).—A circuit and apparatus are described.

W. F. F.

Turntable for exercising rats. E. J. FARRIS and G. ENGVALL (Science, 1939, 90, 144).—Constructional details are given.

W. F. F.

Method of embalming large insects. C. C. SMITH (Science, 1939, 90, 116).

W. F. F.

Apparatus for perfusion at constant pressure and temperature. M. AIAZZI-MANCINI, L. DONATELLI, and G. CIUFFI (Boll. Soc. ital. Biol. sperim., 1939, 14, 434—435).—A supply-burette for the perfusing fluid is immersed in a bath at const. temp. and the fluid is maintained at const. head by means of a pressure-fluid reservoir.

F. O. H.

Apparatus for examining surviving, isolated organs *in vitro*. M. AIAZZI-MANCINI, L. DONATELLI, and G. CIUFFI (Boll. Soc. ital. Biol. sperim., 1939, 14, 432—433).—A const.-temp. bath is fitted with apparatus for washing three segments of the organ simultaneously with the nutrient medium.

F. O. H.

Inexpensive warm stage. E. M. ABRAHAMSON (Science, 1939, 89, 420).—An electric iron heating element may be adapted for use in warming a microscope stage.

W. F. F.

Mounting diatoms in realgar and other substances. G. D. HANNA and W. M. GRANT (J. Roy. Microscop. Soc., 1939, 59, [iii], 174—176).—Realgar, Se, Te, or As is heated electrically on a sheet of mica and volatilised on to the cover on which the diatoms are dusted, the process being carried out in a vac. The covers are cemented to slides with hirax.

A. G. P.

Colorimetric analysis of body fluids and biological material. R. BENIGNI (Biochim. Terap.

sperim., 1939, 26, 397—406).—A method of colorimetric analysis, based on addition to the test fluid of the same amount of known solution or substance as is used for the standard for comparison, is described and exemplified by the determination of cholesterol in normal and pathological blood.

F. O. H.

Spectroscopic analysis of biological fluids for heavy metals. D. W. ARMSTRONG and F. S. BRACKETT (J. Ind. Hyg., 1939, 21, 448—460).—Methods of spectroscopic analysis are discussed with particular reference to the determination of Pb, Mn, and Hg in body fluids, urine, and blood. In the method recommended the fluids are applied to graphite electrodes, and Tl is used as an internal standard for the determination of both Pb and Hg.

J. W. S.

Determination of uric acid by oxidation with cold alkaline potassium ferricyanide. E. BECCARI (Boll. Soc. ital. Biol. sperim., 1939, 14, 384—386).—Uric acid (isolated from deproteinised blood or urine as Ag salt) is oxidised by $K_3Fe(CN)_6-K_2CO_3$, excess of $K_3Fe(CN)_6$ being determined iodometrically or by Na indigotinsulphonate (Flatov, A., 1926, 1283).

F. O. H.

Identification and determination of hexoses in polysaccharides and glycoproteins by the carbazole method. S. GURIN and D. B. HOOD (J. Biol. Chem., 1939, 131, 211—223).—The carbazole reaction of Dische (A., 1930, 632) is applied to the determination and identification of common sugars. The error due to free amino-acids is greater than that due to proteins but the presence of appreciable quantities of tryptophan causes low results. The hexose in the neutral polysaccharide of gastric mucin is galactose and the nature of the hexose in a no. of polysaccharides has been determined.

H. G. R.

Micro-iodometric determination of nitrogen.—See A., 1940, II, 31.

Determination of sulphur (as sulphates) in biological fluids. A. D. MARENZI and R. F. BANFI (Biochem. J., 1939, 33, 1879—1889).—A method is described whereby 5 μ g. of S can be determined as inorg. $SO_4^{''}$ with an accuracy of $\pm 3\%$. Interfering substances are first pptd. by $AlCl_3$ and the inorg. $SO_4^{''}$ is determined colorimetrically or photometrically by reduction of phosphotungstomolybdic acid, after pptn. with benzidine. Substances other than phosphates interfere in the usual methods of determination with benzidine.

P. G. M.

(xxix) NEW BOOKS.

Content of Cells and Proteins in the Normal Cerebrospinal Fluid. A. V. NEEL (Oxford University Press, London, 1939, 141 pp.).—An exhaustive review of methods and findings in the c.s.f. The current standard for the no. of cells in normal fluid is too high and the figure 0 to 0.3 cells per cu.mm. is recommended for the normal. The demonstration of small pathological changes in the cells and proteins is considered of great diagnostic importance. There are 409 references in the bibliography.

F. R. SE.